



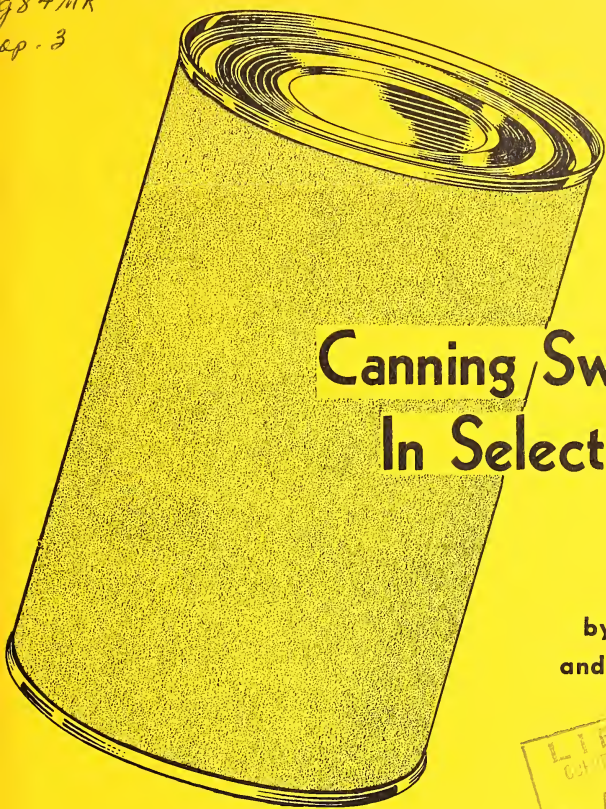


## Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

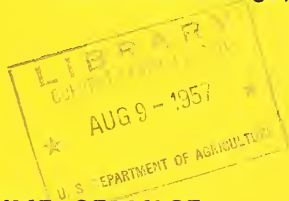


984MR  
sp. 3



# Costs of Canning Sweet Corn In Selected Plants

by Edward C. Collins  
and Job K. Savage, Jr.



**FARMER COOPERATIVE SERVICE**  
**U. S. DEPARTMENT OF AGRICULTURE**

**Marketing Research Report No.184**

**July 1957**



Farmer Cooperative Service  
U. S. Department of Agriculture  
Washington 25, D. C.  
Joseph G. Knapp, Administrator

The Farmer Cooperative Service conducts research studies and service activities of assistance to farmers in connection with cooperatives engaged in marketing farm products, purchasing farm supplies, and supplying business services. The work of the Service relates to problems of management, organization, policies, financing, merchandising, product quality, costs, efficiency and membership.

The Service publishes the results of such studies; confers and advises with officials of farmer cooperatives; and works with educational agencies, cooperatives, and others in the dissemination of information relating to cooperative principles and practices.

---

This study was conducted under authority of the Agricultural Marketing Act of 1946(RMA, Title II).

# Contents

	Page
Summary .....	iii
Purpose of study .....	1
Method of study.....	2
Analysis by plant.....	3
Plant I.....	3
Plant II.....	9
Plant III.....	12
Plant IV.....	16
Plant V.....	19
Plant VI.....	23
Plant VII.....	27
Comparisons by major plant costs.....	30
Raw product.....	30
Acquisition.....	31
Direct labor .....	32
Indirect labor and superintendence .....	33
Processing.....	34
Shipping and labeling.....	34
Selling.....	35
General plant overhead.....	36
Total.....	37
Appendix.....	41
Definition of terms .....	41
Chart of accounts .....	42
Costs by major processing operations.....	45



## Summary

To be successful, small fruit and vegetable processing plants--many owned by farmer cooperatives--need to know their costs and causes for fluctuations in them.

Because some 14 percent of all fruit and vegetable processors can sweet corn, Farmer Cooperative Service made a study of corn-canning costs in seven plants so that other similar plants can compare their own costs with those included in this study.

Seven corn-canning plants supplied cost data for the 1952 and 1953 canning seasons. Costs to produce and sell a case of 24 cans, 303 size in 1952 ranged from \$2.51 to \$3.28, with a median of \$2.60. Costs for 1953 ranged from \$2.30 to \$3.72, with a median cost of \$2.71. To bring the data up to date, 1956 costs of labor, raw product, and condiments were examined, and appropriate modifications in the 1952-53 cost data were made.

Analysis indicated canners can make substantial savings by increase in (a) annual volume, (b) daily volume, (c) case yields per ton of raw product, and (d) uniformity of raw product flow to the plant.

Considerable variation occurred as follows among cost items judged subject to control by canners:

1. The median acquisition cost in 1952 was \$2.11 a ton with a range from \$1.21 to \$7.53; in 1953 the median was \$3.19 with a range from \$0.77 to \$6.95 a ton.

Variations in acquisition costs are caused by amount of field service given growers, terms of purchase for raw product, degree that the processor may share the cost of seed and fertilizer, and raw product yield. These costs should be considered in conjunction with the raw product cost and should not be reduced unless an overall reduction in total raw product cost can be achieved.

2. In 1952, the median direct labor time required per 303 case equivalent was .2955 hours, with a range from .2512 to .3515 hours. In 1953, the median was .3103 hours and the range from .2420 to .3959 hours a case.

Primary cause for variation in all plants except one appeared to be case yields per ton of raw product and average daily output. One plant had an increase in down time and idle time in 1953 compared to 1952 which offset increases in case yield and average daily output.

3. Indirect labor and superintendence costs varied considerably among plants and within the same plants. In 1953, the median was 7.5 cents and the range from 3.2 to 18.3 cents.

Indirect labor and superintendence cost in these plants is of a fixed nature. Increase in the annual volume processed would reduce this cost per case.

4. Processing costs did not vary among plants or within the same plants to the extent that other costs did. In 1952, the median cost for this item

was 88 cents per 303 case, with a range from 84 to 91.4 cents. In 1953, the median was 90.9 cents and the range from 77.5 to 93.7 cents.

There were also variations in can losses, condiments, and other materials among plants. Such factors as quantity discounts, time of purchase, location of purchaser and business acumen seem to reduce this processing cost.

5. Shipping and labeling cost variations were substantial among the plants and within the same plants. In 1952, the median was 14.1 cents per 303 case, and the range from 10.7 to 21.9 cents. In 1953, the median was 13.8 cents with a range from 11.4 to 28.5 cents.

These costs can be reduced by labeling and casing as the product comes off the processing line. Degree of mechanization and type of equipment also caused variations in cost. A uniform flow of processed product reduced these costs.

6. Selling cost varied importantly among plants and within the same plants. The median cost in 1952 was 21.5 cents per 303 case, with a range from 9.1 to 45.5 cents. In 1953, the median was 19.8 cents and the range from 15 to 46.1 cents.

Changes in volume appeared the primary factor affecting this cost item. Differences in the method of sale also caused variations in selling costs.

7. General plant overhead cost also varied considerably among plants and within the same plants. Median cost was 30.7 cents per 303 case in 1952, with a range from 20.1 to 48.7 cents. In 1953, the median was 36.3 cents and the range from 28.6 to 66 cents per case.

Time of plant construction and number of commodities processed also caused variations in cost. Again volume seemed the major factor affecting this cost.

# Costs of Canning Sweet Corn in Selected Plants

By Edward C. Collins and  
Job K. Savage, Jr.<sup>1</sup>

An analysis of costs in canning sweet corn is important to canners, growers, wholesalers, retailers, and consumers of the product. Canners, however, are in the most favorable position to try to reduce these costs.

Effective action must be preceded by pertinent information. Canners should know their costs and causes for variations in them. But the necessary cost analysis is not readily available to small canners--those producing fewer than 250,000 cases annually--because of the expense involved. Yet these small operators can save some 15 to 20 percent of all fruit and vegetables processed in this country each year.

Farmer cooperatives own many small fruit and vegetable processing plants. The same farmers produce the raw product and have it processed for consumer use.

These small cooperatively-owned plants provide important markets for many farmers. They also provide part-time jobs for a number of persons in their vicinity, many of them small farmers. Therefore, Farmer Cooperative Service has made an analysis of costs in seven corn-canning plants to see if their operations and those of other small firms in similar type businesses can be improved.

Approximately 14 percent, or 350 of a total of 2,500 fruit and vegetable canners in this country, can sweet corn. Growers harvested and sold to canners an average of 500,000 acres of sweet corn annually during the 10-year period, 1944 to 1954. They received about \$25 million yearly, or \$50 an acre. In 1954, canners produced slightly over 37 million cases of corn measured in terms of 24/303 case equivalents.<sup>2</sup>

Any advantages enjoyed by small canners may be offset by the disadvantages in having high-cost operations. It is sometimes advocated that small operators can reduce their high costs by adopting more modern business methods. The first step, however, is for canners to know their costs. This study, while not exhaustive on the subject, is designed to provide small corn-canning plants with objective guides to their costs of production.

## Purpose of Study

Canners need cost information about their own operations and those of others producing similar products because it helps them (a) to locate and cor-

<sup>1</sup>Both authors were formerly with the fruit and vegetable branch, marketing division, Farmer Cooperative Service. Mr. Collins is now with the Agricultural Marketing Service and Mr. Savage is chief, special crops branch, marketing division, Farmer Cooperative Service.

Material credit is due Wilbur F. Buck, formerly of the fruit and vegetable branch, Farmer Cooperative Service, and now with Foreign Agricultural Service, for his work in summarizing data and preparing some of the preliminary draft of this report.

<sup>2</sup>Cases of 24 cans, 303 size.

rect inefficient operations, (b) to decide their best alternatives, (c) to price their finished product, (d) to price the raw product of farm producers, and (e) to deal more intelligently with those who supply cans, boxes, condiments, processing equipment, and other materials. In brief, adequate knowledge of costs is necessary for the canner who plans to stay in business.

This study then was made with the following specific purposes in view:

1. To obtain, during two consecutive seasons, detailed data on costs of canning sweet corn from a selected cross section of small plants.
2. To present this cost data by major plant functions and by operations within these functions.
3. To analyze the data so as to indicate (a) fluctuating costs existing among plants, and within the same plants, and subject to canner control and (b) causes, wherever they could be found, for these variations.

## Method of Study

Cost data were obtained for the 1952 and 1953 seasons from seven corn canning plants, two of them cooperatively owned. Five of the plants were in the sweet-corn producing areas of the Midwest, and two were in the Middle Atlantic States.

To bring the data up to date, 1956, costs of labor, raw product, and condiments were examined, and appropriate modifications in the 1952-53 cost data were made.

All plants included in the study had a common objective--to produce canned sweet corn. But there was much variation in them from the standpoints of size, location, age and value; form of ownership; products processed; record-keeping methods; number and makeup of employees; variety of raw product canned; and style, grade, and can sizes of corn processed.

Variation is typical of the canning industry; therefore, cost data were obtained from what was considered a cross section of small to medium operators. In obtaining the data and presenting the findings, each plant was considered as a case study in itself. This method made it possible to point out the important differences among plants in such a way individual cannery can select for comparison the plant most closely resembling their own. This approach also made analysis of cost differences within a plant for the 2 years meaningful and more easily communicated.

This report presents as much description as possible without divulging a plant's identity. Following plant by plant analysis, a comparison of costs for all plants is made. Examination of costs among plants comes only after the reader has had thorough opportunity to examine and weigh the differences among plants.

Prior to their participation in this study, some plants maintained general records while others kept more detailed ones. To obtain comparable information in sufficient detail, a cost record system for sweet-corn cannery was developed. Some details of this system will be presented in connection with the analysis.

Since plants processed various can sizes, it was necessary, for comparative purposes, to convert all can sizes to a 24/303 basis.

Ideally costs on the basis of can size, style, and grade of product are to be desired. In breaking costs down to that point, however, it would have been necessary to develop cost allocation factors by means of time and motion studies. The scope of the present study was not broad enough for this.

Labor and raw product are the two cost items most likely to be affected by style and grade of product. Some of the plants ran only one style and grade of product for certain days of the season. Therefore, some indication of cost variations by grade and style will be presented.

Some plants ran only one can size for several days during the season, thus making it possible to evaluate the effect of can sizes on selected processing costs.

The appendix beginning on page 41 contains definitions of terms, a chart of accounts and summary tables showing costs by major processing operations--all important to an understanding of this report.

## Analysis by Plant

Each plant analysis consists of two parts. Part one contains a brief description of important economic plant details. The second part presents an analysis of each plant's 2-year cost record.

Discussion in connection with Plant I establishes a pattern of analysis for the others in the study. It is more detailed than the others. The same analysis made in connection with Plant I applies to the others but some details are omitted for the sake of brevity. Where the analysis differs among plants, it is discussed in detail.

### Plant I

This section of the report gives a description of Plant I and analyzes its costs.

#### Description

Location: Midwest.

Age: About 28 years, but has been maintained adequately--some major equipment has been replaced and new equipment added.

Ownership: Cooperatively owned and operated by farmers whose raw product it processes--single plant firm.

Plant Value: Plant including land and buildings had a book value of slightly more than \$100,000 in 1954.

Capacity: The capacity of a plant is determined at any given time by the factors having power to limit operations. One such limiting factor in a corn processing plant is the number of operating husking machines. There are slight variations in huskers' speed between plants, but all things considered the number of huskers may be used for the purpose of comparing plant capacities. This plant had 22 huskers that could operate, but all did not have to operate at the same time.

Products Canned: This plant produced canned peas and corn in 1952 and 1953. Two styles of corn--cremogenized<sup>3</sup> and whole kernel--were produced, and they were processed in No. 303 and No. 10 can sizes. Grades of canned corn ranged from Fancy to Standard. The total production for the seasons 1952 and 1953 was as follows:

<u>Product</u>	<u>Volume</u>	
	1952	1953
	(cases on 24/303 basis)	
Corn	76,998	109,563
Peas	103,329	76,849
<b>Total</b>	<b>180,327</b>	<b>186,412</b>

Total production was stable for the 2 years, but a considerable shift in the relative volumes of corn and peas took place. In 1952 corn accounted for about 43 percent of total volume, but by 1953 corn accounted for 59 percent, a shift of 16 percent of total production. For the 5 years, 1950 through 1954, this plant produced an annual average of 65,000 cases, 303 equivalent. Yearly production ranged from about 9,000 in 1950 to 110,000 in 1953.

Of the 1952 corn production, approximately 78 percent was in No. 303 cans and 22 percent in No. 10 cans. In 1953, 73 percent went into No. 303 cans and 27 percent into No. 10 cans. A complete breakdown of the corn packed by grades was not available.

Variety of Sweet Corn Processed: This plant processed three varieties of sweet corn in 1952 and 1953--lochief, Iona, and Tendermost. Complete records of each variety processed were not available.

Control Over Raw Product: Some of the plants in this study maintained strict control over the raw product from time of seeding until it was delivered to the plant. Seeding dates, application of fertilizers, and other husbandry practices were specified by some operators. In this particular plant an average amount of such control was exercised.

Processing Period<sup>4</sup>: In 1952, this plant processed corn for 29 days over a 7-week period; in 1953, all the corn processing took place in 25 days over a 5-week period. In each of the 2 years processing began around August 20.

## Costs

Plant costs for 2 years, 1952 and 1953, are shown and analyzed in somewhat the order in which they were incurred. For example, raw product costs are discussed first, followed by direct labor and the rest. The appendix contains definitions of special terms and a list of the individual cost items included under each major cost subdivision. The cost items are on page 42 under the head, Chart of Accounts. For example, raw product costs will include the cost in terms of dollars paid to farmers. Other costs of product such as trucking expense; fieldman's salary, payroll, taxes and insurance; fieldman's automobile

<sup>3</sup>Cremogenized corn is cut off the cob in the same manner as whole kernel corn. Kernels used in the cream component are ground up by a comminuter. Additional kernels to be used in the product are run through a slitter. The kernels are then blended into a finished product with the three components--sugar, starch, and corn--in their proper proportions to make what the trade calls cremogenized-style corn.

<sup>4</sup>"Period" as used in this report refers to all the time throughout the processing season when the plant processed a designated style or styles and can size or sizes of corn or on a grade basis as in Plant II. See further explanation in the footnote to table 1, page 6.

expense; certain production, harvesting and hauling expenses; and similar items are included in acquisition costs.

Canners varied, however, as to the number of the individual cost items they had under each of the major subdivisions.

For purposes of this study raw product costs are expressed on a per 24/303 case basis and in terms of cost per ton. The total amount of money expended for any item shown may be determined approximately by multiplying the cost per case by the number of cases shown for the individual plant. In some places comparisons are shown in terms of hours of labor per case.

Raw Product: This plant, a cooperative, advanced growers an average of \$14.76 a ton for corn in 1952. In 1953, the advance went up to \$18.54. On a per case basis the advance for raw product was almost 51.9 cents a case in 1952 and 61.3 cents in 1953. Since this plant was cooperatively owned by growers, the price paid for raw product should be considered as an advance rather than final price.

A final settlement of the 1952 corn pool increased returns to growers by about \$3.54 a ton or to a total return of \$18.30 a ton. The final cost of raw product to the plant was 63.1 cents a case in 1952.

Settlement of the 1953 corn pool gave growers an additional \$2.44 a ton or a total return of \$20.98 a ton. The final cost of raw product to the plant was 69.4 cents a case. These costs, including acquisition costs, accounted for 26.4 percent of total costs in 1952 and 33 percent in 1953.

Acquisition cost in this plant was \$1.60 a ton in 1952 and \$6.95 in 1953. A sizable increase in cost by case took place, major ones being as follows:

<u>Acquisition item</u>	<u>Cost per 303 case</u>	
	<u>equivalent</u>	
	1952	1953
	(cents)	
Trucking expense	2.1	5.8
Fertilizers (net)	.3	3.5
Seed (net)	( <sup>1</sup> )	5.5
Picker operations (net)	( <sup>1</sup> )	5.8
Total	2.4	20.6

<sup>1</sup>Less than 0.1 cent.

Differences in the cost of remaining acquisition items were also noted for the 2 years.

An unfavorable growing season was a major cause for the variation in acquisition cost. It is also probable some change in the operational policy of this association took place between the 2 years.

The total amount, including acquisition cost, advanced for raw product by this plant was 68.6 cents a case in 1952 and 92.3 cents in 1953. These costs accounted for 26.4 percent of the total cost in 1952 and 33 percent in 1953.

Direct Labor: How much direct labor was needed to produce a particular style and can size of product? Why did direct labor costs vary within and between seasons in a particular plant? The two-season historical records of the plants in this study offer some explanations but should not be interpreted as conclusive.

Table 1 shows direct labor time required per case for Plant I in 1952. Labor accounted for 9.6 percent of the total costs. Wage rates averaged 81 cents an hour.

Table 1.--Plant I: Production record, 1952

Period <sup>1</sup>	Style of product	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Whole kernel	303	1,453	28.3	.3379
2.....	Cremogenized	303	1,725	29.0	.3182
3.....	Cremogenized	303 and 10	3,030	30.0	.2842
4.....	Cremogenized and whole kernel	303 and 10	4,368	27.9	.2773
Season average.....			2,621	29.0	.2932

<sup>1</sup> A time period refers to all the time throughout the processing season when the plant processed the designated style or styles and can size or sizes of corn. For example, period 1 is the total time whole kernel corn was processed in No. 303 cans, whereas period 4 is the total time cremogenized corn and whole kernel corn were processed in No. 303 cans and No. 10 cans during daily operations.

Direct labor time was highest for this plant in period 1 when it canned only whole kernel corn and lowest in period 4 when it canned cremogenized and whole kernel during the same day's operation. The average number of cases canned on days when only whole kernel was run averaged 1,453 cases, and the average was 4,368 cases when cremogenized and whole kernel were canned during the same day. This difference in average number of cases canned per day appeared the most important reason why labor time varied for these two periods.

Yields for season were highest when cremogenized style corn was canned. This had some effect on cost because high case yields increased the number of cases run per hour and this in turn decreased hourly cost. For the 1952 season, case yields on the average did not vary widely in this plant and therefore could have had only a minor effect on direct labor costs.

Table 2 shows direct labor time required per case for Plant I in 1953. Direct labor accounted for 10.1 percent of total costs. Wage rates averaged 77 cents an hour.

Table 2.--Plant I: Production record, 1953

Period	Style of product	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Whole kernel	303	544	20.1	.5282
2.....	Whole kernel	303 and 10	3,144	24.4	.3225
3.....	Cremogenized	303 and 10	4,907	33.7	.3079
4.....	Whole kernel and cream	303	5,012	30.2	.3306
5.....	Whole kernel and cremogenized	303 and 10	4,991	28.6	.3657
Season average.....			4,382	30.3	.3329

In 1953 highest direct labor cost was incurred in period 1 when whole kernel corn in No. 303 can sizes was processed. This took place when case yields and cans canned were also lower than at any time during the season.

Lowest costs were incurred in period 3 when cremogenized corn was processed. This occurred when case yields were higher on the average than in any other period. Also, during this low cost period cases canned per day averaged more than 4,900. These two factors contributed heavily to cost differences.



Comparison of costs in processing cremogenized corn with those for whole kernel corn is difficult for the 1953 season because of the extremely small amount packed on days when whole kernel only was packed. The fact that case yields varied so widely between two styles also makes comparison difficult.

Data in table 2 support the premise that case yield is an important factor affecting direct labor cost; notice particularly period 1. Average number of cases packed daily in periods 3, 4, and 5 was somewhat alike, but case yields varied from 30.2 in period 4 to 28.6 in period 5. At the same time direct labor time varied from .3079 hours in period 4 to .3657 in period 5.

Direct labor cost varied considerably from one season to the next in all plants. This is one cost area in which canners may take action to increase operating efficiency.

In Plant I direct labor time required per case was .2932 hours in 1952 and .3329 hours in 1953.

Preparation of the raw product for canning took about 50 percent of the direct labor time in this plant, and it was the increase in this item that raised the total in 1953. In 1953, direct labor time per case for this plant increased .0397 hours or, in terms of money, 3.1 cents over 1952. Most of this was accounted for by .0334 hours, or 1.6 cents increase in preparation cost, and 1 cent increase in taxes and insurance cost on salaries paid for direct labor.

On the basis of this plant's 1953 output, savings of \$1,775 would have been made if preparation cost had been held down to the 1952 level.

In this plant, three jobs--husking, ear inspection, and cutting--accounted for about 67 percent of the preparation cost. Most of the cost variation probably took place on these jobs.

Possible causes for direct labor cost variation in this plant were case yields, quality of raw product, grade, style, and can sizes of finished product, volume, and wage rates. Examination of these factors shows case yields were higher in 1953 than in 1952. This would have the effect of reducing rather than raising the 1953 costs. Quality of the raw product as determined by the grades of the finished product were approximately the same over the 2 years. If anything, more of the pack graded Fancy in 1953 than in 1952. Grade, style, and can size of the pack were about the same for both years and should not have caused any appreciable cost variation, but volume increased in 1953 over that in 1952. This could have been a major factor in increased direct labor cost. To make a more precise analysis of effect of increased volume, specific information on plant capacity is needed, and scope of this study did not provide for this.

A further consideration is the possible imbalance among plant operations. Failure to coordinate all plant activities into a unified operation may result in inefficient use of labor. For example, failure to coordinate deliveries of raw product with plant operations will result in idle time and inefficient labor utilization. In addition, where a variety of styles, grades, or can sizes is being processed at the same time and with the same equipment, such as closing machines and retorts, the total plant operation must be coordinated to avoid imbalance or bottlenecks.

Annual corn output of this plant from 1948 through 1952 was 65,000 cases. The 1953 output was about 1.4 times that much, and the plant may have been operating beyond its optimum capacity in terms of labor force employed.

As mentioned, wage rates averaged 81 cents an hour in 1952 and 77 cents in 1953. In general, wage rates over the processing industry were higher in 1953 than in 1952. The lower average paid by this plant in 1953 might have been due to loss of some of their more skilled and higher paid workers. Management should try to pay a wage attractive enough to keep their skilled workers because inefficient low-paid labor may increase labor cost. This suggestion is also based on the fact that direct labor hours required per case increased from .2932 hours in 1952 to .3329 in 1953; at the same time wage rate per hour was decreasing.

Indirect Labor and Superintendence: Cost of indirect labor and superintendence was 5.4 cents a case in 1952 and 3.2 cents in 1953. These costs accounted for 2.1 percent of total costs in 1952 and 1.2 percent in 1953. Reduction in cost from 1952 to 1953 was due in large part to increase in volume, while superintendence and indirect labor hours remained about the same. There is a possibility that plant efficiency in 1953 would have increased if superintendence hours had been increased as volume increased.

Other Direct Processing: This group of costs, which was made up mostly of can, box, and condiment costs, was 88 cents a case in 1952 and 86.3 cents in 1953. These costs accounted for 33.9 percent of all costs in 1952 and 30.9 percent in 1953.

These costs are subject to limited control by the canner, especially small canners. Some savings may be made by canners through careful buying and improvements in handling and storing these materials. Plant 1's reduction in cost of these materials in 1953 was due to lower prices paid for them.

Shipping and Labeling: Costs of shipping and labeling were 17.9 cents a case in 1952 and 15.5 cents in 1953. Shipping and labeling cost was 6.9 percent of total cost in 1952 and 5.5 percent in 1953.

Canners have little influence over cost of labels, but there is much labor involved in putting labels on and this item is subject to some control by the canner. In this plant these costs dropped with increased volume.

The plant also operated with improved labeling equipment for the 1953 pack. The methods of selling may also affect shipping and labeling costs for a plant.

Selling: Selling expense for this plant in 1952 was 19.8 cents a case and 17.7 cents in 1953. This expense accounted for 7.6 percent of total costs in 1952 and 6.3 percent in 1953. Increased volume was probably responsible for most of the 2.1 cents reduction in the expense of this item. In some plants reorganization of the sales force can bring important savings in terms of actual expenses and in terms of increased efficiency.

Some canners sell their products under buyers' labels; this is particularly true of small canners. Many sell a small part under their own label and the majority of the pack under buyers' labels and a few sell all of their pack under their own label. Comparison of shipping and labeling costs is complicated by reason of these practices. This study does not analyze costs on the basis of method of sales, but rather as a total selling function of the plant.

General Plant Overhead: The reader may refer to the chart of accounts in the appendix, page 44 for the specific expense items included in this group. These expense items amounted to about 35.1 cents a case in 1952 and 36.3 cents in 1953. They accounted for 13.5 percent of total costs in 1952 and 13 percent of total costs in 1953. As a group there was little change over the 2 years, but individually there was some.

As volume increased, plant overhead cost decreased from 14.7 cents a case in 1952 to 8.3 cents in 1953.

Plant supplies went up from 1.9 cents a case in 1952 to 5.3 cents in 1953. The reason for this increase was not apparent. Price of supplies increased somewhat over the 2 years, but not nearly enough to account for the difference in costs. If this canner in 1953 had maintained his plant supply cost level at the 1952 level, he would have saved about \$3,681. For a plant the size of this one, a saving of that amount would have been appreciable.

Other expense items in this group such as financial expense, officers' and administrative salaries, office supplies, and taxes and insurance are relatively stable over short periods. They are not subject to control by the canner to any large extent, but good business management may effect minor savings. The actual cash outlay for these items is not necessarily indicative of their degree of efficiency. It may be suggestive, however.

Table 3 is a cost summary per case by major items for Plant I in 1952 and 1953.

Table 3.--Plant I: Summary of costs, 1952 and 1953

Cost item	1952 cost per 303 case equivalent	Percent of total cost	1953 cost per 303 case equivalent	Percent of total cost
Raw product.....	\$0.630	24.3	\$0.694	24.8
Acquisition.....	.055	2.1	.230	8.2
Direct labor.....	.249	9.6	.281	10.1
Indirect labor and superintendence.....	.054	2.1	.032	1.2
Processing.....	.880	33.9	.863	30.9
Shipping and labeling.....	.179	6.9	.155	5.5
Selling.....	.198	7.6	.177	6.3
General plant overhead.....	.351	13.5	.363	13.0
Total.....	2.596	100.0	2.795	100.0

## Plant II

This section of the report gives a description of Plant II and analyzes its costs.

### Description

Location: Midwest.

Age: This plant has been operated by the same firm since 1934. It is not certain just how old the plant is, but it was probably built around 1930. It has been maintained in a better-than-average state of repairs. In recent years cremogenizing equipment has been installed.

Ownership: Cooperatively owned by farmers--single plant firm.

Plant Value: Book value was slightly in excess of 160,000 in 1954.

Capacity: Operating huskers in 1953 numbered 22.

Products Canned: This plant produced one product only in 1952 and 1953--cremogenized cream corn in No. 303 cans. Grades of corn canned ranged from Fancy to Standard. This plant produced 245,091 cases in 1952 and 132,438 in

1953, a decline in production of almost one-half. Production records prior to 1952 were not available.

Variety of Sweet Corn Processed: This plant processed five varieties of corn in 1952 and four in 1953. Percentages of each were as follows:

<u>Variety</u>	1952 (percent)	1953 (percent)
Tendermost	51	26
Golden Bounty	22	44
Victory Golden	13	11
Iochief	10	19
Iona	4	-
	<u>100</u>	<u>100</u>

Control Over Raw Product: In this particular plant, an average amount of control over the raw product was maintained before it reached the plant.

Processing Period: In 1952, this plant processed corn for 30 days over a 6-week period, and in 1953, for 19 days over a 5-week period. In each of the 2 years, processing began about the middle of August.

### Costs

Raw Product: This cooperative plant advanced growers an average of \$24.21 a ton for corn in 1952 and \$19.62 in 1953. On a per case basis the advance was about 68 cents in 1952 and 58.5 cents in 1953.

Final settlement of the 1952 corn pool resulted in returns to growers of an additional \$6.33 a ton, giving them a total return of \$30.54 a ton for corn that year. Cost of the raw product to the plant was, therefore, increased by about 17.8 cents a case, resulting in a final per case cost of 85.8 cents for the raw product.

In 1953, to meet competitive prices, growers received over-advances on their corn of about \$7.14 a ton, giving them an adjusted return of \$12.48 a ton for corn that year.<sup>5</sup> Cost of corn to the plant as finally adjusted was 37.2 cents a case.

Acquisition cost in this plant was \$1.21 a ton in 1952 and 77 cents in 1953. A sizable decrease in acquisition cost per case took place in 1953 over 1952--3.4 cents a case in 1952 compared to 2.3 cents in 1953. The cost records show \$2,871 as expense for use of field equipment in 1952; they show no expenditure for this item in 1953. This item accounted for most of the difference. Other 1953 acquisition costs remained about the same as in 1952.

The total cost, including acquisition, for raw product to this plant was 89.2 cents a case in 1952 and 39.5 cents in 1953. This was 35.4 percent of total cost in 1952 and 17.2 percent in 1953.

Direct Labor: Table 4 shows direct labor time required per case for Plant II in 1952. This accounted for about 11.7 percent of total costs. Wage rates averaged 94.6 cents an hour.

<sup>5</sup>The \$7.14 over-advance was charged against the reserves of the organization.

Table 4.--Plant II: Production record, 1952

Period	Style of product	Grade	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Cremogenized	Fancy	303	8,158	34.2	.2901
2.....	Cremogenized	Extra	303	7,809	35.7	.3074
		Standard	303	8,444	37.0	.2980
3.....	Cremogenized	Standard	303			
Season average.....				8,170	35.6	.2975

The 1952 direct labor time varied little by grade of product packed. This was to be expected because the number of cases canned per day did not vary importantly for any of the three periods. Case yields were also high for each period.

The record of this plant in 1952 lends little support to the often expressed idea that it takes more labor to pack Fancy corn than it does for Standard or Extra Standard.

On a day-by-day basis, number of cases canned and case yields per ton of raw product were main factors affecting labor costs. For example, there were 2 days during the 1952 season when this plant packed fewer than 3,000 cases, and yields per ton of raw product were below 27 cases a ton. When that happened, labor cost went up above 43 cents a case as compared with the season average of about 30 cents. There was one other day during this season when daily pack was below 3,000 cases, but case yield was up to 38 cases a ton and direct labor cost went up only 4 cents a case above the season average.

Table 5 shows direct labor time required per case for Plant II in 1953. Direct labor accounted for 13.2 percent of total costs. Wage rates averaged 93 cents an hour.

Table 5.--Plant II: Production record, 1953

Period	Style of product	Grade	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Cremogenized	Fancy	303	6,469	33.0	.3198
2.....	Cremogenized	Extra	303	9,643	35.5	.2767
		Standard	303			
Season average.....				7,338	33.5	.3103

The 1953 direct labor time increased about .0128 hours, or about 2.2 cents, a case over 1952. For this plant, two factors--average number of cases canned daily and case yields--varied materially between the 2 years and probably accounted for most of 1953 direct labor cost increase.

Most of the increase in direct labor time occurred in preparation, silage, and receiving operations in that order. In this plant, preparation of the raw product accounted for about 55 percent of direct labor time in each of the 2 years and in this operation three jobs--husking, ear inspection, and cutting--accounted for most of the preparation time. If substantial savings on direct labor are to be made in this plant, they will have to come about through increased efficiency on these jobs.

Indirect Labor and Superintendence: Cost of indirect labor and superintendence was 3.6 cents a case in 1952 and 5.5 cents in 1953. These accounted for about 1.4 percent of total costs in 1952 and 2.4 percent in 1953.

The increase in 1953 of 1.9 cents a case was largely due to the approximately 46 percent decrease in 1953 plant volume.

Other Direct Processing: These costs increased from 86.6 cents a case in 1952 to 91.8 cents in 1953. Most of this increase reflected the higher cost of cans and condiments. Direct processing costs accounted for 34.4 percent of total costs in 1952 and 39.9 percent in 1953.

Shipping and Labeling: Costs for shipping and labeling were about 13.8 cents a case in 1952 and 13 cents in 1953--only a minor saving. These costs accounted for 5.5 percent of total cost in 1952 and 5.7 percent in 1953.

Selling: Selling expenses for this plant were about 9 cents a case in 1952 and 15 cents in 1953. This significant increase of 6 cents was principally due to the 46 percent decrease in 1953 volume. Selling expenses accounted for about 3.6 percent of total costs in 1952 and about 6.5 percent in 1953.

General Plant Overhead: These expenses amounted to about 20 cents a case in 1952 and 34.8 cents in 1953. They accounted for 8 percent of total cost in 1952 and 15.1 percent in 1953.

The 46 percent decrease in 1953 volume was the major factor in accounting for that year's increase in general overhead and factory burden expense. Officers' and employees' salaries increased from 2.5 cents a case in 1952 to 4.9 cents in 1953, and plant overhead increased from 10.7 cents to 18.1 cents a case. Cost of plant supplies also went up from about 3.1 cents a case in 1952 to 6.3 cents in 1953.

Table 6 summarizes major costs per case for Plant II in 1952 and 1953.

Table 6.--Plant II: Summary of costs, 1952 and 1953

Cost item	1952 cost per 303 case equivalent	Percent of total cost	1953 cost per 303 case equivalent	Percent of total cost
Raw product.....	\$0.858	34.0	\$0.372	16.2
Acquisition.....	.034	1.4	.023	1.0
Direct labor.....	.295	11.7	.303	13.2
Indirect labor and superintendence.....	.036	1.4	.055	2.4
Processing.....	.866	34.4	.918	39.9
Shipping and labeling.....	.138	5.5	.130	5.7
Selling.....	.091	3.6	.150	6.5
General plant overhead.....	.201	8.0	.348	15.1
Total.....	2.519	100.0	2.299	100.0

### Plant III

This section of the report gives a description of Plant III and analyzes its costs.

#### Description

Location: Midwest.

Age: About 30 years of age--has been maintained in a high state of repair--modern equipment has been added over the years.

Ownership: By a medium to small sized corporation--multiple plant firm.

Plant Value: Book value of almost \$140,000 in 1954.

Capacity: Operating huskers in 1952 and 1953 numbered 24.

Products Canned: This plant canned whole kernel corn and a combination of peas and carrots in 1952 and 1953. Corn was packed in No. 303, No. 1, and 8-ounce can sizes, and grades ranged from all Fancy in 1952 to Fancy and Extra Standard in 1953. Total production for the seasons 1952 and 1953 follows:

<u>Product</u>	<u>Volume</u>	
	1952 (cases on 24/303 basis)	1953
Corn	225,176	231,235
Peas and carrots	147,022	171,888
Total	372,198	403,123

Production of corn varied little between the 2 years, but peas and carrots were up about 25,000 cases in 1953 over 1952.

Variety of Sweet Corn Processed: This plant processed five varieties of corn in 1952, and four in 1953. The next tabulation shows percentages for each of the 1952 varieties. No breakdowns were available for 1953.

<u>Variety</u>	1952 (percent)
Tendermost	62
Iochief	21
Country Gentleman	7
Victory Golden	6
Golden Princess	4

Control Over Raw Product: Plant III maintained a maximum of control over raw product from time of planting until it reached the plant. Dates of planting, fertilizing, and cultivating for harvesting were specified on a contract basis for growers supplying corn.

Processing Period: In each of the years, 1952 and 1953, this plant processed corn for 37 days. In 1952, processing took place over a 6-week period. In 1953, processing took place over a 7-week period. In each of the 2 years, processing began just after the middle of August.

### Costs

Raw Product: This plant paid growers an average of \$24.08 a ton for corn in 1952 and \$21.36 in 1953. On a per case basis, price to growers was about 72.5 cents in 1952 and 69.7 in 1953.

In this plant, acquisition cost was about \$7.53 a ton in 1952 and \$2.83 in 1953. On a per case basis, acquisition cost was 22.7 cents in 1952 and 9.2 cents in 1953.

The higher acquisition cost in 1952 was due to a loss on farming operations Plant II engaged in. This plant included its farm operation in producing sweet corn as a part of its overall plant costs. In a strict sense, such costs should be separated from processing costs.

The total raw product cost, including acquisition, amounted to 95.2 cents a case in 1952 and almost 79 cents in 1953. These costs accounted for 33 percent of total costs in 1952 and 29.8 percent in 1953.

Direct Labor: Table 7 shows direct labor time required per case for Plant III in 1952. Direct labor accounted for about 9.3 percent of total costs. Wage rates averaged 93.9 cents an hour.

Table 7.--Plant III: Production record, 1952

Period	Style of product	Grade	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Whole kernel	Fancy	303	2,724	27.4	.3301
2.....	Whole kernel	Fancy	303 and 8-oz.	6,531	33.6	.2579
3.....	Whole kernel	Fancy	303, 1, and 8-oz.	6,567	33.0	.2735
4.....	Whole kernel	Fancy	303 and 1	6,098	33.4	.2611
Season average.....				6,086	33.2	.2634

The differences among the four periods were in actual can sizes processed. Large variations in direct labor time occurred when volumes and case yields varied. This was true within as well as among the periods. There were 5 days during the 1952 season when case yield was below 30 cases a ton and volume was under 3,000 cases a ton. On those days, direct labor time ranged from .3282 hours a case to .4217 hours, as compared with a season average of .2634 hours a case.

Table 8 shows direct labor time required per case for Plant III in 1953. Direct labor accounted for 11.2 percent of total cost. Wage rates averaged 94.1 cents an hour.

Table 8.--Plant III: Production record, 1953

Period	Style of product	Grade	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Whole kernel	Fancy and Extra Standard	303	2,714	22.3	.4214
2.....	Whole kernel	Fancy and Extra Standard	303 and 8-oz.	5,512	29.5	.3219
3.....	Whole kernel	Fancy and Extra Standard	303 and 10-oz.	7,058	32.4	.2624
4.....	Whole kernel	Fancy and Extra Standard	303, 1, and 8-oz.	6,568	30.0	.2778
Season average.....				6,250	30.6	.2876

This plant experienced its lowest direct labor time on days when volume and case yields were highest. There were 10 days during the 1953 season when daily volume was over 8,000 cases. On 8 of the 10 days, case yields were above 34 cases a ton. Highest direct labor time for any of these days was .2664 hours a case (on 1 day), and on 6 of 10 days, direct labor time was between .22 and .23 hours. On the remaining 3 days, direct labor time was between .23 and .26 hours a case.

There were 3 days when volume was less than 3,000 cases and yields were less than 30 cases a ton. Direct labor time for those 3 days ranged from .6905 hours a case to .4214 hours as compared with a season average of .2876 hours a case. This high labor time occurred when the plant first started processing and again when the season was ending. The high labor requirement suggests



that processors should exercise close supervision in determining whether or not it is economical to process small daily volumes. From an economic point of view, processors must at least be able to cover all of their direct costs--primarily such items as labor and raw product costs.

When the 1952 season is compared with the 1953 season, it appears that case yield was the important factor affecting direct labor time. Yields were down in 1953 and direct labor time went up about .0242 hours a case.

This plant experienced its lowest direct labor time in both years when it was producing daily volumes of about 8,000 cases with above average case yields.

Most of the increase in direct labor time occurred in the jobs of preparation and silage in that order. In this plant preparation time accounted for practically 60 percent of direct labor used in both years.

Ear inspection, husking, and cutting were the major preparation operations. On the basis of the 2-year record, this plant can keep its direct labor time down to a minimum by processing from 8,000 to 9,000 cases daily of high yielding corn.

Indirect Labor and Superintendence: Cost of indirect labor and superintendence was 9.9 cents a case in 1952 and 7.5 cents a case in 1953. Reduction in money outlay for this item from 1952 to 1953 was largely due to the fact a bonus was paid to indirect labor in 1952 but was not paid in 1953.

Indirect labor cost accounted for approximately 3.4 percent of total costs in 1952 and 2.9 percent in 1953.

Other Direct Processing: These costs remained about the same, at approximately 91 cents a case in each of the 2 years. These costs accounted for almost 32 percent of total costs in 1952 and 34.3 percent in 1953.

Shipping and Labeling: Cost to ship and label corn products of this plant remained steady from 1952 to 1953, at about 11 cents a case. These costs accounted for 3.7 percent of total cost in 1952 and 4.3 percent in 1953.

Selling: Selling expense for this plant was 22.4 cents a case in 1952 and 17.6 cents in 1953. Primarily the decrease was due to a decrease in expense of three items--brokerage paid, cash discount allowed, and swell discount allowance.<sup>6</sup> Selling expenses accounted for 7.8 percent of total costs in 1952 and 6.7 percent in 1953. A small percentage of the decrease in selling expense in 1953 took place because of increase in volume in that year over 1952.

General Plant Overhead: These expenses amounted to about 30.8 cents a case in 1952 and 28.6 cents in 1953. The 1953 decrease in this cost item appeared due to two factors; administrative salaries were lowered and total volume output increased slightly. Cost of plant supplies remained about the same for the 2 years.

Table 9 summarizes major costs per case for Plant III in 1952 and 1953.

<sup>6</sup>See item 8 in the section headed Definition of Terms, page 41.

Table 9.--Plant III: Summary of costs, 1952 and 1953

Cost item	1952 cost per 303 case equivalent	Percent of total cost	1953 cost per 303 case equivalent	Percent of total cost
Raw product.....	\$0.725	25.3	\$0.697	26.3
Acquisition.....	.227	7.9	.092	3.5
Direct labor.....	.266	9.3	.296	11.2
Indirect labor and superintendence.....	.099	3.4	.075	2.9
Processing.....	.914	31.9	.909	34.3
Shipping and labeling.....	.107	03.7	.114	4.3
Selling.....	.224	7.8	.176	6.7
General plant overhead.....	.308	10.7	.286	10.8
Total.....	2.870	100.0	2.645	100.0

## Plant IV

This section of the report gives a description of Plant IV and analyzes its costs.

### Description

Location: Midwest.

Age: Exact age not available but was probably built in 1920's--has been maintained in high state of repair and modern equipment has been added over the years.

Ownership: By small corporation--multiple plant firm.

Plant Value: Book value about \$70,000 in 1954.

Capacity: Operating huskers in 1952 and 1953 numbered 10.

Products Canned: This plant is primarily a corn canning plant. In 1952 and 1953, its records showed it packed exclusively whole kernel corn in 303 can sizes, graded Fancy. In addition to its corn operations, the plant packed a small volume of such products as pumpkin, peas, and beets. Total corn production recorded in 1952 and 1953 was as follows:

<u>Product</u>	<u>Volume</u>	
	1952	1953
Corn	141,552	117,382

(cases on 24/303 basis)

Volumes of other products packed in the plant in 1952 and 1953 were not furnished.

Variety of Sweet Corn Processed: This plant processed four varieties of corn in 1952 and 1953 as shown in the next tabulation. In 1952, an exact percentage by breakdown was not available.

<u>Variety</u>	<u>1953</u> (percent)
Foremost	10
Lee	73
Gold Rush	8
Tendermost	9
	<u>100</u>

While exact percentages for 1952 were not available for each variety, Lee variety was the one packed most frequently in that year.

Control Over Raw Product: This plant maintained maximum control over raw product from time of planting until the product was processed. Dates of planting, fertilizing, cultivating, and harvesting were specified on a contract basis for growers supplying corn.

Processing: In 1952, this plant processed corn for a total of 32 days over a 7-week period. In 1953, processing took place on 27 days over a 5-week period. In each of the 2 years, processing began just before the middle of August.

### Costs

Raw Product: This plant paid growers an average of \$19.10 a ton for corn in 1952 and \$18.81 a ton in 1953. On a per case basis, cost to the plant was about 64.5 cents in 1952 and 63.9 cents in 1953. Raw product cost accounted for approximately 26 percent of total costs in 1952 and 24 percent in 1953.

Acquisition cost in this plant was \$2.11 a ton in 1952 and \$3.19 in 1953. On a per case basis, acquisition cost in 1952 was 7.1 cents; in 1953 it was 9.1 cents. Total dollar expense for acquisition was slightly higher in 1953 because the number of cases produced decreased about 34,168 from that of 1952. Total raw product cost, including acquisition, amounted to 71.6 cents a case in 1952 and 73 cents in 1953. Acquisition cost amounted to approximately 2.8 percent in 1952 and 3.4 percent in 1953.

Direct Labor: Table 10 shows direct labor time required per case for Plant IV in 1952. This cost accounted for about 11.8 percent of total cost in 1952. Wage rates averaged 96 cents an hour.

Table 10.--Plant IV: Production record, 1952

Period	Style of product	Grade	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Whole kernel	Fancy	303	4,455	29.6	.2955

Since this plant processed only one style, grade, and can size of product, it was not necessary to list data in more than one period for the entire season. Within the season, highest daily cost took place on days of lowest volume and case yields. In 1952, there were few large deviations from the seasonal average case yield. The highest cost for any single day's operation during 1952 occurred when cases canned fell below 3,000 and case yield per ton was below the seasonal average of 29.6 per ton.

Lowest direct labor cost in terms of hours occurred when daily volume was from 4,000 to above 5,000 cases and yields per ton were above the seasonal average. For example, during 5 days in 1952 when daily volume was above 5,000 cases and average case yield was slightly above the season average, average direct labor time was .2641 hours compared with a season average of .2955 hours.

Table 11 shows direct labor time required per case for Plant IV in 1953.

Table 11.--Plant IV: Production record, 1953

Period	Style of product	Grade	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Whole kernel	Fancy	303	4,348	29.5	.2804

Direct labor costs accounted for approximately 12.3 percent of total costs in 1953. Wage rates averaged \$1.13 an hour.

In 1953, this plant canned only one style and grade of product. As in 1952, highest direct labor time was experienced on those days having lowest volume and case yields. There were 5 consecutive days during 1953 on which case yields and daily output were well below the season's average. For those 5 days, case yields averaged 26.2 cases a ton and output 1,877 cases a day, and direct labor time averaged .2900 hours compared to an average of .2840 for the season. Generally speaking, direct labor time did not vary greatly until daily output fell below 3,000 cases--the exception being when case yields per ton were well below the season average.

Preparation time accounted for about half of total direct labor time. In 1953, reduction in preparation time from that of 1952 accounted for most of the increased direct labor efficiency. This plant reduced its entire labor time about .0115 hours from that of 1952. At the same time its direct labor costs per case increased from 29.6 cents in 1952 to 33 cents in 1953 because of an increase in wage rates from 96 cents an hour in 1952 to \$1.13 in 1953.

With the increase in wage rates, there was an increase in efficiency in terms of direct labor hours per case but not in the same ratio. Labor efficiency in terms of hours per case increased approximately 4 percent and dollar cost per case increased about 12.7 percent.

Because average case yield for the season and daily output remained about the same over the 2 years, they have to be ruled out in this instance as factors affecting changes in average cost figures.

Indirect Labor: Costs of indirect labor and superintendence were 2.9 cents a case in 1952 and 3.6 cents a case in 1953. Approximately the same dollar expenditure was made in 1953 as in 1952, but total plant output was down about 36,000 cases. This decrease accounted for the difference in costs between the 2 years.

Indirect labor costs accounted for about 1.1 percent of total costs in 1952 and 1.3 percent in 1953.

Other Direct Processing: In 1952, direct processing costs amounted to 84.6 cents a case; in 1953, they were 87.9 cents a case. The increase in 1953 was largely due to increased cost of cans and condiments.

Direct manufacturing costs accounted for 33.8 percent of total costs in 1952 and 32.4 percent in 1953.

Shipping and Labeling: Costs of shipping and labeling corn products in this plant were 13.5 cents a case in 1952 and 15.2 cents in 1953. Increased cost in 1953 was due largely to an increase in labor wages. In addition, volume was down in 1953.

Shipping and labeling costs accounted for 5.4 percent of total costs in 1952 and 5.6 percent in 1953.

Selling: Selling expenses for this plant were 19.7 cents a case in 1952 and 21.3 cents in 1953. Increase in 1953 cost of selling was due largely to an increase in sales salaries and a decrease in volume.

Selling expenses accounted for almost 8 percent of total costs in both 1952 and 1953.

General Plant Overhead: These expenses amounted to about 28.8 cents a case in 1952 and 36.7 cents in 1953. The 1953 increase in this item was due to an increase in administrative salaries and expenses, plant overhead, and cost of plant supplies. These increases coupled with a decrease in plant output accounted for most of the difference.

General plant overhead accounted for approximately 11.5 percent of total costs in 1952 and 13.5 percent in 1953.

Table 12 summarizes major costs per case for Plant IV in 1952 and 1953.

Table 12.--Plant IV: Summary of costs, 1952 and 1953

Cost item	1952 cost per 303 case equivalent	Percent of total cost	1953 cost per 303 case equivalent	Percent of total cost
Raw product.....	\$0.645	25.7	\$0.639	23.6
Acquisition.....	.071	2.8	.091	3.4
Direct labor.....	.296	11.8	.333	12.3
Indirect labor and superintendence.....	.029	1.1	.036	1.3
Processing.....	.846	33.8	.879	32.4
Shipping and labeling.....	.135	5.4	.152	5.6
Selling.....	.197	7.9	.213	7.9
General plant overhead.....	.288	11.5	.367	13.5
Total.....	2.507	100.0	2.710	100.0

## Plant V

This section of the report gives a description of Plant V and analyzes its costs.

### Description

Location: Middle Atlantic States.

Age: Built during 1920's--has been maintained in an average state of repair--minimum of modern equipment added.

Ownership: By a family corporation--a multiple plant firm.

Plant Value: Book value of slightly over \$250,000.

Capacity: Operating huskers in 1952 and 1953 totaled 34.

Products Processed: This plant canned cream-style corn, whole kernel corn, and succotash. Its products were packed in 303, and 8-oz. cans and grades ranged from Fancy to Standard in 1952 and 1953. About 34 percent of

1952 production graded Fancy, 46 percent Extra Standard, and the remaining 20 percent Standard. In 1953, approximately 13 percent of output graded Fancy, 18 percent Extra Standard, and 69 percent Standard. Total production for 1952 and 1953 was as follows:

<u>Product</u>	<u>Volume</u>	
	1952 (cases on 24/303 basis)	1953
Corn	133,052	114,368
Succotash	18,402	29,484
Total	151,454	143,852

Production of plant decreased approximately 5.7 percent from 1952 to 1953.

Variety of Sweet Corn Processed: This plant processed both yellow and white varieties of corn, but information was not available as to names and quantities of each.

Control over Raw Product: Control over raw product was not as extensive as that maintained by midwestern plants previously mentioned.

Processing: In 1952, this plant processed corn and succotash for a total of 31 days during a 7-week period, starting during the first part of August. In 1953, the plant operated for 40 days during a 10-week period, starting the first week in August.

#### Costs

Raw Product Cost: This plant paid growers an average of \$24.30 a ton for corn in 1952 and \$24.47 in 1953. On a per case basis, the cost was about 67.7 cents in 1952 and 69.6 cents in 1953. Difference in per case cost between the years 1952 and 1953 was due to a slightly smaller case yield in 1953 and to a 17-cent a ton increase paid growers.

Acquisition cost was about \$5.38 a ton in 1952 and \$3.10 in 1953. On a per case basis acquisition cost was 14.9 cents a case in 1952, and 8.8 cents in 1953. Major acquisition expense items for 2 years follow:

<u>Acquisition item</u>	<u>Cost per 300 case basis</u>	
	1952	1953
Field equipment	4.0	1.4
Net cost of seed corn	2.2	0.3
Foreign labor	4.6	0.3
Trucking	2.5	4.1
Total	13.3	6.1

Expense of trucking corn was the only one of the four items to increase in 1953 over the 1952 season.

Total raw product costs in 1952, including acquisition, amounted to 82.5 cents a case and 78.4 cents in 1953. These costs accounted for 28.7 percent of total costs in 1952 and 26 percent in 1953.

**Direct Labor Cost:** Table 13 shows 1952 direct labor time required per case for Plant V. Direct labor accounted for 10.1 percent of 1952 total costs. Wage rates averaged 80.3 cents an hour.

Table 13.--Plant V: Production record, 1952

Period	Style of product	Grade	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Cream	Extra Standard	303	5,634 for 9 days	38.1	.2963
2.....	Cream	Extra Standard	303 and 8-oz.	6,159 for 9 days	33.7	.2952
3.....	Cream, whole kernel, and succotash	Extra Standard	303 and 8-oz.	4,480 for 9 days	37.4	.3328
4.....	Whole kernel and succotash	Extra Standard	303	1,248 for 4 days	31.1	.5484
Season average.....				4,886 for 31 days	35.9	.3139

Case yields were high for this plant, averaging 35.9 cases a ton for the season.<sup>7</sup> That did not appear to have been an important factor affecting costs in the plant in 1952 as there were only 6 days when yields were below 34 cases a ton.

Daily output of this plant was the important factor affecting direct labor time. When daily output fell below 3,000 cases, direct labor time increased sharply. For example, in period 4 lowest daily output was just below 1,000 cases, and direct labor time averaged .5484 hours compared with the season average of .3139. Also in period 3 when daily output averaged about 4,500 cases a day, direct labor time climbed above the season average. Lowest direct costs were experienced by this plant when it was producing a daily output of above 5,000 cases per day. Its best operating level appeared to be between 6,000 and 8,000 cases.

Preparation required more direct labor time than other operations, accounting for about 55 percent of it. When daily output declined, preparation and canning were the two operations most affected. This plant did not have any silage cost as the others in the study did. Growers hauled the silage away for feed.

This plant operated double lines during about two-thirds of the 1952 season, but this did not appear to increase the direct labor time required per case.

Table 14 shows 1953 direct labor time required per case for Plant V. Direct labor accounted for 11.5 percent of total costs in 1953. Wage rates averaged 82.1 cents an hour.

Lowest direct labor time occurred in period 3 when average daily output was slightly over 8,000 cases. Case yields were high during this period but did not appear to be the major factor influencing cost.

Highest direct labor time was in period 6 when daily output averaged 1,087 cases a day. Case yields during this same period were well below the seasonal average but did not appear to be the major factor affecting direct labor time. In periods 5, 7, and 8, daily output was below 3,000 cases and direct labor time was well above the season average.

Any effect on direct labor time due to grade and can size appear to be overshadowed by effects of daily output and case yields, with case yields being secondary to daily volume.

<sup>7</sup>Case yields are for corn only and not for other ingredients used in succotash.

Table 14.--Plant V: Production record, 1953

Period	Style of product	Grade	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Cream	Extra Standard and Standard	303	3,946 for 14 days	35.5	.4209
2.....	Cream	Extra Standard	303 and 8-oz.	5,397 for 1 day	37.5	.3824
3.....	Cream corn and cream succotash	Extra Standard and Standard	303	8,091 for 7 days	36.8	.3281
4.....	Cream corn and cream succotash	Standard	303 and 8-oz.	6,173 for 1 day	41.4	.3743
5.....	Cream corn and whole kernel succotash	Standard	303	2,683 for 2 days	28.1	.5266
6.....	Whole kernel corn and succotash	Fancy and Extra Standard	303	1,087 for 4 days	29.2	.6922
7.....	Whole kernel succotash	Fancy	303	949 for 8 days	29.1	.4241
8.....	Whole kernel and cream succotash	(Unknown)	8-oz.	1,028 for 3 days	30.6	.4702
Season average.....				3,596 for 40 days	35.2	.3959

The 1953 corn crop in the vicinity of this plant was adversely affected by extremely dry weather. This resulted in an uneven flow of raw products to the plant and appears the major factor in the increase in direct labor time. Average daily output was 3,596 cases compared with 4,886 for 1952. In 1953, there were also 22 days, or 55 percent of the season, when daily output was well below 3,000 cases. In 1952, daily output fell below 3,000 cases on only 7 days, or 23 percent of the season.

Indirect Labor and Superintendence: Costs of indirect labor and superintendence were approximately 8.8 cents a case in 1952 and 11.4 cents in 1953. The major factor accounting for the increase in indirect labor cost in 1953 over 1952 was expenditure for prepack and postpack labor. In 1952, cost for this item was slightly less than 1 cent a case. In 1953, it increased to slightly over 4 cents a case. In an older plant such as this one, there is likely to be considerable variation in cost to get the plant opened and closed each season.

Indirect labor cost accounted for approximately 2.9 percent of total cost in 1952 and 3.8 percent in 1953.

Other Direct Processing Costs: These costs were 93.9 cents a case in 1952 and 91.2 cents in 1953. The slight decrease in 1953 was due to some of the manufacturing materials being obtained for less than in 1952. These costs accounted for 32.6 percent of total cost in 1952 and 30.2 in 1953.

Shipping and Labeling: Costs for shipping and labeling corn products of this plant were 21.9 cents a case in 1952 and 28.5 cents in 1953. Variation in labeling and shipping labor accounted for most of the 1953 increase. Labor cost for labeling and shipping was about 15.8 cents in 1952 compared with 21.7 cents in 1953. This plant had less mechanization in labeling and casing than other plants in this study.

Costs for shipping and labeling are subject to wide fluctuation, and considerable savings are possible through controlling them. These costs accounted for 7.6 percent of total costs in 1952 and 9.4 percent in 1953.



**Selling Expense:** Selling expense for this plant was 21.5 cents a case in 1952 and 19.8 cents in 1953. Reduction in 1953 was due to smaller amount paid for brokerage and cash discounts. This expense accounted for 7.5 percent of total expenses in 1952 and 6.6 percent in 1953.

**General Plant Overhead:** These expenses amounted to 30.6 cents a case in 1952 and 35.7 cents in 1953. Two factors were primarily responsible for the 1953 increase; volume decreased and dollar expenditure for office building and equipment overhead increased. With the exception of this one major expense item--dollars spent--others under this account remained stable. Total plant output in 1953 was 7,626 cases less than in 1952. This decrease in output contributed to the increase in fixed cost per case.

Table 15 summarizes major costs per case for Plant V in 1952 and 1953.

Table 15.--Plant V: Summary of costs, 1952 and 1953

Cost item	1952 cost per 303 case equivalent	Percent of total cost	1953 cost per 303 case equivalent	Percent of total cost
Raw product.....	\$0.676	23.5	\$0.696	23.1
Acquisition.....	.149	5.2	.088	2.9
Direct labor.....	.292	10.1	.348	11.5
Indirect labor and superintendence.....	.082	2.9	.114	3.8
Processing.....	.939	32.6	.912	30.2
Shipping and labeling.....	.219	7.6	.285	9.4
Selling.....	.215	7.5	.198	6.6
General plant overhead.....	.306	10.6	.377	12.5
Total.....	2.878	100.0	3.018	100.0

## Plant VI

This section of the report gives a description of Plant VI and analyzes its costs.

### Description

**Location:** Middle Atlantic States.

**Age:** Built in 1920's--minimum of modern equipment added.

**Ownership:** By a family corporation--single plant firm.

**Plant Value:** Book value of about \$50,000 in 1954.

**Capacity:** Operating huskers in 1952 and 1953--14.

**Products Processed:** This plant canned whole kernel, both yellow and white varieties, in 303 and 8-oz. cans in 1952. In 1953, some corn was packed in No. 1 cans in addition to 303 and 8-oz. Grades of corn packed were Fancy and Extra Standard with most of the pack grading Fancy in each of the 2 years. The total production for 1952 and 1953 was as follows:

<u>Product</u>	<u>Volume</u>	
	1952	1953
Corn	62,099	53,621

Plant output decreased about 14 percent in 1953 from that of 1952.

Variety of Sweet Corn Processed: This plant processed three varieties of corn in 1952 and four in 1953. Percentages of each variety are shown in the next tabulation.

<u>Variety</u>	<u>1952</u> (percent)	<u>1953</u> (percent)
Country Gentlemen	56 <sup>1</sup>	56
Scarlet on Gold	-	33
Victory Garden	9 <sup>1</sup>	5
Seneca Market	25 <sup>1</sup>	<u>6</u>

<sup>1</sup> Approximate percentages; mixed varieties were canned on 4 days during the season.

Control Over Raw Product: Control over raw product was not as complete in this plant as it was in those located in the Midwest.

Processing: In 1952, this plant processed on 34 days during an 8-week period. In 1953, it processed 27 days during an 8-week period. Production began the first part of August in each of the 2 years.

### Costs

Raw Product: This plant paid growers an average of \$22.59 a ton in 1952 and \$23.02 in 1953. On a per case basis, cost was 72.7 cents in 1952 and 86.9 cents in 1953. The large per case increase in costs in 1953 was due primarily to low per ton case yields. In 1953, a serious drought affected the corn crop within the area of this plant.

In this plant acquisition cost was 4.25 cents a ton in 1952 and 3.89 cents in 1953. On a per case basis, cost was 13.7 cents in 1952 and 14.7 cents in 1953. Lower yields in 1953 offset decrease in per ton cost that year.

Total raw product cost in 1952, including acquisition, was 86.4 cents; in 1953 it was \$1.05. These costs accounted for 26.4 percent of total costs in 1952 and 27.4 percent in 1953.

Direct Labor: Table 16 shows 1952 direct labor time required per case for Plant VI. Direct labor accounted for about 9.4 percent of total costs. Wage rates per hour averaged 80.8 cents.

Table 16.--Plant VI: Production record, 1952

Period	Style of product	Grade	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Whole kernel	Extra Standard and Fancy	303	1,683 for 14 days	32.3	.3484
2.....	Whole kernel	Extra Standard and Fancy	303 and 8-oz.	1,927 for 20 days	30.4	.3534
Season average.....				1,826 for 34 days	31.1	.3515

Case yields and output per day were the two factors having greatest influence on direct labor time in this plant. Of these two, case yields appeared the more important.

This plant experienced its lowest direct labor cost when case yields were 33 cases a ton and above and daily output was above 2,400 cases. There were 6 days during the season when this occurred, and during that time direct labor time averaged .2983 hours a case compared to the season's average time of .3515 hours a case.

The effect of average daily plant output was not as evident in this plant as it was in some other plants in the study. There were 9 days during the season when daily output averaged 2,198 cases, case yields averaged 30.3 cases a ton, and direct labor time per case was .3309 hours.

There were 7 days during the season when daily output averaged 1,533 cases, yields averaged 31.7 cases a ton, and direct labor time averaged .3494 hours per case.

A comparison of the 7-day period with the 9-day period showed that daily case output declined about 30 percent in the 7-day period, case yields increased about 4.6 percent, and average direct labor time increased about 5.6 percent.

There were also 2 days during this season when daily output was 729 cases but case yields were high--above 34 cases a ton--and time in hours per case averaged .3429 hours. To compare with this there were 2 days when daily output was 434 cases, case yields averaged 25 cases a ton, and direct labor time per case averaged .7937 hours.

This plant canned two sizes of corn during some days of the season, but this did not appear to have any major effect on direct labor time.

Table 17 shows 1953 direct labor time required per case for Plant VI. Direct labor accounted for 9.2 percent of total costs. Average wage rate per hour was 80.8 cents.

Table 17.--Plant VI: Production record, 1953

Period	Style of product	Grade	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Whole kernel	Extra Standard and Fancy	303	2,193 for 12 days	29.1	.3649
2.....	Whole kernel	Extra Standard and Fancy	303 and 8-oz.	1,988 for 10 days	25.7	.4028
3.....	Whole kernel	Fancy	303 and 1	1,197 for 3 days	19.4	.4716
4.....	Whole kernel	Fancy	303, 8-oz., and 1	1,916 for 2 days	23.8	.4151
Season average.....				1,986 for 27 days	26.5	.3898

As in 1952, the two major factors affecting direct labor time per case were case yields and average daily plant output. As shown in table 17, lowest direct labor time occurred when the plant had an average output of 2,193 cases a day and the highest yield per ton during the season--29.1 cases. Highest time required per case occurred when case yield per ton was lowest--19.4--and average daily plant output was lowest--1,197 cases.

In periods 2 and 4, case yields were 25.7 and 23.8--a decrease of 7.4 percent from period 2 to period 4. The direct labor time per case was .4028

hours in period 2 and .4151 in period 4, or an increase of about 3 percent. Volume also decreased by about 3.6 percent in period 4 from period 2. The increase in direct labor time per case was not in proportion to the decrease in case yields nor the average daily output, but it was in the direction expected. Of these two factors, case yields appears to be a more important factor.

When 1953 direct labor time was compared with that of 1952, it was noted that an increase from .3515 hours per case in 1952 to .3898 in 1953, or an increase of about 10.9 percent, took place. At the same time average case yield decreased from 31.1 cases a ton in 1952 to 26.5 in 1953, a decrease of 14.8 percent. There was, however, in 1953 an increase in daily plant output of 303 basis cases of 18 percent. This appears to have offset some of the effect on direct labor time of lower 1953 case yields.

Indirect Labor and Superintendence: Costs of indirect labor and superintendence were 13.7 cents a case in 1952 and 18.3 cents in 1953. The increase in 1953 over 1952 was partly due to an increase in salaries, but more importantly to the 14 percent decrease in volume.

The indirect labor cost accounted for about 4.2 percent of total costs in 1952 and 4.9 percent in 1953.

Other Direct Processing: These costs increased from 88.2 cents a case in 1952 to 93.7 cents in 1953. Cost of cans accounted for most of the increase between the 2 years. Direct processing costs accounted for 26.9 percent of total costs in 1952 and 25.2 percent in 1953.

Shipping and Labeling: Costs of shipping and labeling products of this plant were 14.1 cents a case in 1952 and 12 cents in 1953. The most important item causing the 1953 increase was expense for labels. Cost of warehouse supplies also increased slightly. Shipping and labeling costs accounted for 4.3 percent of total cost in 1952 and 3.2 percent in 1953.

Selling: Selling expense for this plant was 45.5 cents a case in 1952 and 46.1 cents in 1953. The slight increase in the 1953 cost was due to decrease in volume that year. Total dollar expenditure for sales was less in 1953 than in the previous year and if volume had not decreased by 14 percent, sales expense would have decreased appreciably.

Selling expense accounted for about 13.9 percent of total costs in 1952 and 12.4 percent in 1953.

General Plant Overhead: These expenses amounted to about 48.7 cents a case in 1952 and 66 cents in 1953. The 1953 increase was due to an increase in total dollar expenditure for salaries, administrative expense, depreciation, taxes, insurance, maintenance and repairs, and plant operations. In addition to increased dollar expenditure, a 14 percent drop in 1953 plant volume was an important factor in increasing expense for that year.

Assuming the same volume in 1953 as in 1952 and leaving total dollar expenditure per case the same, costs for general plant overhead would have been about 57 cents in 1953 instead of 66 cents. These expenses accounted for 14.9 percent of total costs in 1952 and 17.7 percent in 1953.

Table 18 summarizes major costs per case for Plant VI in 1952 and 1953.

Table 18.--Plant VI: Summary of costs, 1952 and 1953

Cost item	1952 cost per 303 case equivalent	Percent of total cost	1953 cost per 303 case equivalent	Percent of total cost
Raw product.....	\$0.727	22.2	\$0.869	23.4
Acquisition.....	.137	4.2	.147	4.0
Direct labor.....	.310	9.4	.343	9.2
Indirect labor and superintendence.....	.137	4.2	.183	4.9
Processing.....	.882	26.9	.937	25.2
Shipping and labeling.....	.141	4.3	.120	3.2
Selling.....	.455	13.9	.461	12.4
General plant overhead.....	.487	14.9	.660	17.7
Total.....	3.276	100.0	3.720	100.0

## Plant VII

This section of the report gives a description of Plant VII and analyzes its costs.

### Description

Location: Midwest.

Age: Not available, but estimated to have been built in early 1930's--maintained in excellent condition--modern equipment added.

Ownership: By a medium-size corporation--multiple plant firm.

Plant Value: Book value allocated to corn, slightly less than \$40,000 in 1954.

Capacity: Operating huskers in 1952 and 1953--12.

Products Canned: This plant processed several products--a highly diversified operation. Corn was packed in 303 cans, and grades ranged from Fancy to Standard. In 1952, 81 percent of the pack graded Fancy, 18 percent Extra Standard, and 1 percent Standard. In 1953, the pack graded 75 percent Fancy, 22 percent Extra Standard, and 3 percent Standard.

<u>Product</u>	<u>Volume</u>	
	1952 (cases on 24/303 basis)	1953
Corn	159,358	145,597

Volume of other products packed in this plant in 1952 and 1953 was not furnished.

Variety of Sweet Corn Processed: Varieties of corn processed by this plant were not furnished.

Control Over Raw Product: A maximum of control over the raw product was maintained from time of planting until it reached the plant.

Processing: In 1952, this plant processed corn on 30 days during a 6-week period and in 1953, on 26 days during a 5-week period. In each of the 2 years, processing began around the middle of August.

## Costs

**Raw Product:** This plant paid growers an average of \$17.76 a ton for corn in 1952 and \$15.82 in 1953. On a per case basis, cost of corn to the plant was 57.4 cents in 1952 and 49.9 cents in 1953. The decrease was due to the lower price paid for corn and higher case yield per ton.

In this plant, acquisition cost was \$2 a ton in 1952 and \$4.89 in 1953. On a per case basis, acquisition cost in 1952 was 6.8 cents and 15.5 cents in 1953.

Difference in cost between the 2 years is explained by the fact that this plant had a net return of \$6,500 for trucking, fertilizing, corn harvesting, and dusting in 1952. But in 1953, these same items cost approximately \$4,000. In addition, the net cost of seed corn was about \$9,000 compared to \$2,000 in 1952.

Total raw product cost per case in 1952, including acquisition, came to 67.3 cents and to 65.4 cents in 1953. These costs accounted for about 26 percent of total costs in 1952 and 26.3 percent in 1953.

Table 19.--Plant VII: Production record, 1952

Period	Style of product	Grade	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Whole kernel	Fancy, Extra Standard, and Standard	303	5,312	29.4	.2512

Daily volume and case yields were the two most important factors affecting direct labor time. The flow of raw product to this plant was highly uniform; however, there were only 6 days out of 30 when daily output fell below 5,000 cases. Daily case yields varied considerably, however.

On 6 days when daily output was below 5,000 cases, direct labor time per case averaged .3596 hours. During these 6 days, case yields averaged 25.9 cases a ton, well below the season average. On one of these 6 days, output was only 210 cases with a case yield per ton of 19.8 and direct labor time increased 1 hour per case (1.17 hours).

On the 6 days when daily output was highest, with an average of 6,817 cases a day, and cases per ton of raw product were 30.8, direct labor time averaged only .2336 hours a case.

Table 20.--Plant VII: Production record, 1953

Period	Style of product	Grade	Actual can size	Average number of cases daily (303 basis)	Average case yield per ton (303 basis)	Direct labor time per case (hours)
1.....	Whole kernel	Fancy, Extra Standard, and Standard	303	5,600	31.7	.2420

In 1953, the same two factors, daily output and case yields, were primarily responsible for variations in direct labor time per case. There were 8 days out of 26 during this season when daily output was below 5,000 cases (average

of 3,351 cases), yields per ton were 24.9 cases, and direct labor time per case was about 35 percent higher than the season average of .2420 hours a case.

On 8 days when daily output was highest (average of 7,175 cases) and case yields per ton averaged 35.5, direct labor time was about 9 percent below the season average of .2420 hours a case.

Difference in direct labor time between the two seasons was primarily due to higher case yields and a slight increase in average daily output in 1953. It is probable that this plant's direct labor cost would have been even lower in 1953, but for a decrease in uniformity of raw product flow to the plant.

**Indirect Labor and Superintendence:** Costs of indirect labor and superintendence were 11.6 cents a case in 1952 and 11.9 cents in 1953. There was a slight decrease in total expenditure for indirect labor in 1953, but this was offset by an 8.6 percent decrease in volume. This decrease in volume would probably have had a greater effect on cost except that this plant decreased its days of operation by 13 percent in 1953.

Indirect labor and superintendence cost accounted for about 4.5 percent of total costs in 1952 and 4.8 percent in 1953.

**Other Direct Processing:** These costs amounted to about 84 cents a case in 1952 and 77.5 cents in 1953. The reduction in 1953 was the result of a decrease in cost of manufacturing materials, primarily cans.

Other direct processing costs accounted for 32.5 percent of total costs in 1952 and 31.2 percent in 1953.

**Shipping and Labeling:** Costs of shipping and labeling corn were 15.1 cents in 1952 and 13.8 cents in 1953. Most of this difference was accounted for by lower label cost.

These costs accounted for 5.8 percent of total costs in 1952 and 5.6 percent in 1953.

**Selling:** In total these expenses varied little from 1952 to 1953--25.1 cents a case in 1952 and 24.4 in 1953. The decrease in 1953 volume would have caused an increase in sales expense per case, but this was offset primarily by a reduction in 1953 advertising expenditures. Selling expenses accounted for 9.7 percent of total costs in 1952 and 9.8 percent in 1953.

**General Plant Overhead:** These expenses changed little from 1952 to 1953--29.5 cents a case and 30 cents a case, respectively. Lower 1953 volume would likely have caused a greater increase, but this was partially offset by a reduction of general overhead expenditure such as administrative salary expenses and financing costs. The decrease in 1953 volume did increase plant overhead about 0.05 cents a case, but reduction in general overhead cost also offset this.

Table 21 summarizes major costs per case for Plant VII in 1952 and 1953.

Table 21.--Plant VII: Summary of costs, 1952 and 1953

Cost item	1952 cost per 303 case equivalent	Percent of total cost	1953 cost per 303 case equivalent	Percent of total cost
Raw product.....	\$0.605	23.3	\$0.499	20.1
Acquisition.....	.068	2.6	.155	6.2
Direct labor.....	.263	10.2	.255	10.2
Indirect labor and superintendence.....	.116	4.5	.119	4.8
Processing.....	.840	32.5	.775	31.2
Shipping and labeling.....	.151	5.8	.138	5.6
Selling.....	.251	9.7	.244	9.8
General plant overhead.....	.295	11.4	.300	12.1
Total.....	2.589	100.0	2.485	100.0

## Comparisons by Major Plant Costs

The seven plants in this study were selected to show various processing characteristics, and their average costs should not be construed as representative of those of industry as a whole. To prevent such misconceptions and to present a composite picture of the seven plants, each major cost area will be discussed in terms of median, low, and high.

Costs that vary are most susceptible to control; therefore, attention will be focused on cost comparisons among plants for a given year and also for a given plant between years.

Purpose of this section is to focus on differences in costs among the seven plants and, where data permits, to suggest and analyze causes for variation.

### Raw Product

Cost of corn varied considerably from plant to plant because of differences in per ton prices and yields.

Table 22 compares yearly variations within and among plants on the basis of prices paid per ton, yields per ton, and costs per case. The combined effects of price per ton and yield were reflected in cost per case. For example, as price paid per ton increased, cost per case increased except where an increase in case yields per ton offset the increase in price per ton. In Plant I, price per ton increased 15 percent, but yield also increased by 4 percent and net increase in cost per case was 11 percent.

Table 22.--Comparison of cost of corn among seven plants for 1952 and 1953, using 1952 as a base

Plant	Cost per ton		Case yield per ton		Cost per case, 303 basis	
	1952	1953	1952	1953	1952	1953
	<i>(dollars)</i>		<i>(cases, 303 basis)</i>		<i>(cents)</i>	
I.....	18.30	20.98	29.0	30.3	63.1	69.4
II.....	30.54	<sup>1</sup> 12.48	35.6	33.5	85.8	37.2
III.....	24.08	21.36	33.2	30.6	72.9	69.7
IV.....	19.10	18.81	29.6	29.5	64.5	63.9
V.....	24.30	24.47	35.9	35.2	67.6	69.6
VI.....	22.59	23.02	31.1	26.5	72.7	86.9
VII.....	16.87	15.82	29.4	31.7	57.4	49.9

<sup>1</sup> Plant II is a cooperative. Growers were advanced \$19.62 a ton; this was too high relative to disposition of finished product by about \$7.14.

The median price paid for corn in 1952 was \$22.59, and in 1953 it was \$20.98, where median is the plant's cost that falls at the mid-point between the highest and the lowest cost.

Plants paying below median prices in 1952 paid from \$16.87 to \$19.10, and in 1953 from \$21.36 to \$24.47 per ton.

The median cost per case was 67.6 cents in 1952 and 69.4 cents in 1953.

Costs per case below the median ranged from 57.4 to 64.5 cents in 1952 and in 1953 from 37.2 to 63.9 cents.

Costs per case above the median ranged from 72.7 to 85.8 cents in 1952, and in 1953 from 69.6 to 86.9 cents.



As previously mentioned, Plants I and II are cooperative organizations and prices paid per ton of corn have been adjusted to show gain or loss due to the association's yearly operations. In 1953, Plant II made an over-advance of about \$7.14 a ton to growers, and final price as shown in Table 22 has been adjusted accordingly. Operations of this plant in 1952 were such that they returned growers \$6.33 a ton for their corn in addition to the initial advance payment.

In 1952, there was some slight evidence of a relationship between price paid per ton and case yield per ton. The three plants paying lowest prices per ton had an average case yield of 29.4; the three paying highest prices per ton had a case yield of 33.4. The plant paying median price per ton had the lowest case yield per ton, however.

In 1953, there was little evidence of a relationship between price paid per ton and case yields. The three plants paying lowest prices per ton had an average case yield of 30.6; the three paying highest prices had a case yield of 30.7. The median plant had next to the lowest case yield.

These plants did not pay for corn on yield or quality basis, and there was little evidence obtained in this study to support a conclusion that price per ton and yields or quality were related.

## Acquisition

There were some extreme variations in acquisition costs within and among plants. In 1952, median acquisition cost per ton was \$2.11; in 1953, it was \$3.19 (table 23).

In 1952, acquisition costs below the median ranged from \$1.21 to \$2 a ton; those above the median from \$4.25 to \$7.53.

In 1953 acquisition costs below the median ranged from 77 cents to \$3.10 a ton; those above the median from \$3.89 to \$6.95 a ton.

Table 23.--Comparison of acquisition costs among seven plants, 1952 and 1953

Plant	Cost per ton		Case yield per ton		Cost per case, 303 basis	
	1952	1953	1952	1953	1952	1953
	<i>(dollars)</i>		<i>(cases, 303 basis)</i>		<i>(cents)</i>	
I.....	1.60	6.95	29.0	30.3	5.5	22.9
II.....	1.21	.77	35.6	33.5	3.4	2.3
III.....	7.53	2.83	33.2	30.6	22.7	9.2
IV.....	2.11	3.19	29.6	29.5	7.1	9.1
V.....	5.38	3.10	35.9	35.2	14.9	8.8
VI.....	4.25	3.89	31.1	26.5	13.7	14.7
VII.....	2.00	4.89	29.4	31.7	6.8	15.5

There were wide fluctuations in cost per case within plants and among plants from 1952 to 1953. Between 1952 and 1953, cost per case within plants fluctuated from a high of 17.4 cents to a low of 1 cent. Median cost per case in 1952 was 7.1 cents, in 1953 it was 9.2 cents.

The three plants having per case costs below the median in 1952 showed a range from 3.4 to 6.8 cents; the three above the median, from 13.7 cents to 22.7 cents.

In 1953, the median cost per case was 9.2 cents; the three acquisition costs above the median ranged from 14.7 cents to 22.9 cents.

Variations in case yields added to or decreased the cost per case depending on whether yields were up or down. It is to the mutual interest of growers and processors to develop incentives that encourage production of high-quality and high-yielding corn. Some of the plants shared in the production, harvesting, and hauling costs with the growers. Variations in these practices among plants were primary causes for differences in acquisitions costs, which should be considered in conjunction with the raw product price.

## Direct Labor

Fluctuation in direct labor time required per case within and among plants was not as wide as were those for acquisition costs (table 24). Considering total costs of direct labor, however, and possibilities of effecting savings on them, fluctuations in time required per case are of great importance.

The high time plant in 1952 was 1.4 times as high as the low time plant-- .3515 hours a case compared to .2512 for the lowest plant.

In 1953, the high time plant was 1.6 times as high as the lowest time plant-- .3959 hours a case compared to .2420 hours. This difference may represent whether or not the processor operates with a profit or loss.

Comparing the same plant for 2 years, the median variation in cost was 9 percent.

Table 24.--Comparison of direct labor time in hours per case for seven plants, 1952 and 1953

Plant	Time per case, 303 basis		Average number of cases daily for season		Case yield per ton	
	1952	1953	1952	1953	1952	1953
	(hours)		(cases)		(cases)	
I.....	.2932	.3329	2,621	4,382	29.0	30.3
II.....	.2975	.3103	8,170	7,338	35.6	33.5
III.....	.2634	.2876	6,086	6,250	33.2	30.6
IV.....	.2955	.2804	4,455	4,348	29.6	29.5
V.....	.3139	.3959	4,886	3,596	35.9	35.2
VI.....	.3515	.3898	1,826	1,986	31.1	26.5
VII.....	.2512	.2420	5,312	5,600	29.4	31.7

Variation in direct labor time among the plants below the median ranged from 4 to 5 percent; variation for the plants above the median ranged from 11 to 26 percent.

In 1952, median direct labor time required per case was .2955 hours. Plants below the median ranged from .2512 to .2932 hours a case, and those above the median from .2975 to .3515 hours a case.

In 1953, the median in hours per case was .3103, the three plants below the median ranged from .2420 to .2876, and the three plants above the median ranged from .3329 to .3959 hours a case.

Except for Plant I, primary causes for variations in direct labor time appeared to be case yields and average daily output. In Plant I, average daily output increased about 67 percent in 1953 over 1952, and direct labor time per case increased about 14 percent. It appeared this plant was operating inefficiently in terms of labor force utilization or equipment or both. Coordination in plant operations, including delivery of raw product, seemed the critical factor. Down time and idle time were higher in 1953 than in 1952.

In the other six plants, case yields and daily output were important factors affecting direct labor time. Generally as case yields per ton increase, cases processed per unit of time increase. This is because more of the finished product is being processed from the same quantity of raw product without a corresponding increase in labor time.

For example, no more labor is usually required to husk and cut a high-yielding product than a low-yielding one. Actually it may take less time. As volume from husking and cutting operations increases in a plant, the work pace of those ahead of these two operations seems to increase. In other words, the working speed ahead of these two operations seems to be partially governed by them. The reverse of this happens when husking and cutting operations slow down. There are, of course, limits to how much husking and cutting speed can influence the remainder of the operations.

There is a need for plant management to pay more attention to determining optimum speeds of husking and cutting operations as they relate to others in the plant and to achieving proper coordination among all plant operations.

Daily plant output seems to have somewhat the same effect on direct labor time as case yields do. When the plant has a relatively large supply of raw product on hand, all operations speed up, resulting in more cases processed per hour with the same labor and with less cost. These two factors--case yields and daily average supply of raw product on hand--should receive more consideration by management in their search for ways to reduce direct labor time and cost.

A uniform flow of raw product close to the most efficient operating capacity of the plant would do much to reduce direct labor time in the seven plants included in this study.

Corn yields affect direct labor time and this is an additional reason plant operators should do all possible to encourage growers to produce high-quality and high-yielding corn. For example, growers could be paid on a formula basis that gives full consideration to yield and quality. This would encourage high quality and high case yields per ton.

## Indirect Labor and Superintendence

Variations in these costs among plants and within the same plants were considerable, variations among plants being greater than those within the same plant for the 2-year period (table 25). Indirect labor and superintendence cost is of a fixed nature; therefore, volume is an important factor affecting it.

Table 25.--Comparison of indirect labor and superintendence cost of seven plants, 1952 and 1953.

Plant	Cost per case, 303 basis		Plant output for season, 303 basis	
	1952	1953	1952	1953
	<i>(cents)</i>		<i>(cases)</i>	
I.....	5.4	3.2	76,998	109,563
II.....	3.6	5.5	245,091	132,438
III.....	9.9	7.5	225,176	231,235
IV.....	2.9	3.6	141,552	117,382
V.....	6.1	10.8	133,052	114,368
VI.....	13.7	18.3	62,099	53,621
VII.....	11.6	11.9	159,358	145,597

In 1952, the median cost per case was 6.1 cents. For the three plants below the median, the cost per case ranged from 2.9 cents to 5.4 cents, and for the three above the median, costs ranged from 9.9 cents to 13.7 cents.

In 1953, the median cost was 7.5 cents a case; the three plants below the median ranged from 3.2 cents to 5.5 cents per case. The three plants above the median ranged from 10.8 to 18.3 cents a case.

The change in costs within the same plant from 1952 to 1953 ranged from a low of 0.3 cents to a high of 4.7 cents. A reduction in annual volume was accompanied by an increase in cost per case. On the other hand, costs were reduced when volume was increased.

Indirect labor accounted for between 1 and 5 percent of total costs over the 2-year period for all plants. Median percentage was 3 percent.

## Processing

Variations in processing costs among plants and within the same plants were low compared to that in other major cost areas (table 26). Variations among plants were slightly higher than those within the same plant for the 2-year period. Quantity discounts and making purchases at the most opportune time were probably the most important factors accounting for variations in these costs.

Table 26.--Comparison of processing costs of seven plants, 1952 and 1953

Plant	Cost per case, 303 basis	
	1952	1953
	(cents)	
I.....	88.0	86.3
II.....	86.6	91.8
III.....	91.4	90.9
IV.....	84.6	87.9
V.....	93.9	91.2
VI.....	88.2	93.7
VII.....	84.0	77.5

In 1952, processing costs among plants ranged from 84 cents a case to 91.4 cents, with a median of 88 cents. In 1953, these costs ranged from 77.5 cents a case to 93.7 cents a case, with a median of 90.9 cents.

Changes in costs per case between the 2 years within the same plant ranged from a low of 0.5 cents to a high of 6.5 cents a case. The median change was 3.3 cents.

For the 2 years, 1952 and 1953, processing costs accounted for from 25 to 34 percent of total costs, with a median of 32 percent.

## Shipping and Labeling

Variations in shipping and labeling costs among the seven plants and within the same plants were substantial (table 27). The manufacturer does not have

much control over cost of labels but he does have some over labor cost in labeling. Volume, again, is an important factor affecting this cost area. These costs are also materially reduced by labeling and casing as the corn is processed. Because some of these cost items are relatively fixed, and because some of the plants performed a larger proportion of the labeling and casing as the corn was processed, variations among the seven plants were often greater than those within the same plants over the 2-year period.

Table 27.--Comparison of shipping and labeling costs of seven plants, 1952 and 1953

Plant	Cost per case, 303 basis		Plant output for season, 303 basis	
	1952	1953	1952	1953
	<i>(cents)</i>		<i>(cases)</i>	
I.....	17.9	15.5	76,998	109,563
II.....	13.8	13.0	245,091	132,438
III.....	10.7	11.4	225,176	231,235
IV.....	13.5	15.2	141,552	117,382
V.....	21.9	28.5	133,052	114,368
VI.....	14.1	12.0	62,099	53,621
VII.....	15.1	13.8	159,358	145,597

In 1952, shipping and labeling costs per case ranged from 10.7 cents to 21.9 cents with a median of 14.1 cents. In 1953, these costs per case ranged from 11.4 cents to 28.5 cents, with a median of 13.8 cents.

The change between the 2 years within the same plant ranged from a low of 0.7 cents to a high of 6.6 cents a case. The median plant had a 1.7-cent change in cost per case.

Shipping and labeling costs over the 2-year period accounted for from 3 to 9 percent of total costs, the median being 6 percent.

## Selling

Variations in selling costs among plants and within the same plant over the 2-year period were substantial. Changes in volume appeared a primary factor affecting selling cost. This was particularly true where large variations in volume occurred. (Note Plants I and II in table 28.) Plants also used different methods of selling, which resulted in cost variations.

In 1952, selling costs per case varied from 9.1 to 45.5 cents, with a median cost of 21.5 cents. In 1953, the cost per case ranged from 15 to 46.1 cents, with a median of 19.8 cents.

Variations in cost per case within the same plant varied from 0.6 cents to 5.9 cents with a median cost change of 1.7 cents a case during the 2-year period. Selling cost accounted for from 4 to 14 percent of total costs with a median of 8 percent for the 2-year period.

Table 28.--Comparison of selling costs of seven plants, 1952 and 1953

Plant	Cost per case, 303 basis		Plant output for season, 303 basis	
	1952	1953	1952	1953
	<i>(cents)</i>		<i>(cases)</i>	
I.....	19.8	17.7	76,998	109,563
II.....	9.1	15.0	245,091	132,438
III.....	22.4	17.6	225,176	231,235
IV.....	19.7	21.3	141,552	117,368
V.....	21.5	19.8	133,052	114,368
VI.....	45.5	46.1	62,099	53,621
VII.....	25.1	24.4	159,358	145,597

### General Plant Overhead

Variations in these costs among the seven plants and within the same plants were substantial over the 2-year period. Changes in volume were a major cause of variation. This was particularly true where changes in volume were substantial. (Note Plants II and IV in table 29)

Table 29.--Comparison of general plant overhead costs of seven plants, 1952 and 1953

Plant	Cost per case, 303 basis		Plant output for season, 303 basis	
	1952	1953	1952	1953
	<i>(cents)</i>		<i>(cases)</i>	
I.....	35.1	36.3	76,998	109,563
II.....	20.1	34.8	245,091	132,438
III.....	30.8	28.6	225,176	231,235
IV.....	28.8	36.7	141,552	117,382
V.....	30.6	37.7	133,052	114,368
VI.....	48.7	66.0	62,099	53,621
VII.....	29.5	30.0	159,358	145,597

Cost per case for general plant overhead in 1952 ranged from 20.1 to 48.7 cents with a median of 30.6 cents. Cost per case in 1953 ranged from 28.6 to 66 cents, with a median of 36.3 cents. Variations in cost within the same plant ranged from 0.5 cents to 17.3 cents in the 2-year period. The median change was 7.1 cents a case.

These costs accounted for from 8 to 18 percent of total costs, with a median of 12 percent over the 2-year period.

#### Allocating Overhead Expenses

Corn processors are faced with rather wide year-to-year fluctuations in the volume of corn processed. The direction of the fluctuations cannot be

predicted either as to years or the magnitude of the change. The effects of changes in volume on costs--especially overhead costs--has been demonstrated in this report. These volume changes cause variations in costs that cannot be controlled by the processor. The resultant changes in costs, however, may exert an influence on the processor in pricing the finished product. Insofar as costs are considered in pricing, the processor tends to establish relatively low prices when volumes are higher than average and higher prices when the volume is lower than average.

Effects of seasonal volume fluctuations on costs can be leveled out between years by basing overhead costs on a 5-year moving average volume figure. This is the most recent 5-year period. As each anniversary is reached, the oldest year of the series is dropped and the new year is added. Thus in determining the cost per case, the average volume during some specified period is used rather than the actual volume processed in that season. This method levels the peaks and valleys of fluctuations in annual volumes, but does reflect current data by considering only the most recent period. Other time intervals can be used such as a 3-year or 7-year moving average depending upon the needs of the processor.

This method of allocating overhead expenses has the further advantage of permitting accurate budgeting of costs and receipts. Changes in costs thus more nearly reflect the actual utilization of resources. This method tends to further stabilize grower prices for the cooperative type of organization operating on a net pool basis.

### Total

Total costs per case among the seven plants ranged from \$2.51 a case to \$3.28, with a median of \$2.60 in 1952 (table 30). Total cost per case in 1953 ranged from \$2.30 to \$3.72, with a median of \$2.71.

The variation among the seven plants over the 2-year period ranged from 4 to 14 percent, with a median of 8 percent.

Table 30.--Comparison of total costs of seven plants, 1952 and 1953

Plant	Cost per case, 303 basis		Plant output for season, 303 basis	
	1952	1953	1952	1953
	<i>(dollars)</i>		<i>(cases)</i>	
I.....	2.60	2.79	76,998	109,563
II.....	2.52	2.30	245,091	132,438
III.....	2.87	2.65	225,176	231,235
IV.....	2.51	2.71	141,552	117,382
V.....	2.88	3.02	133,052	114,368
VI.....	3.28	3.72	62,099	53,621
VII.....	2.59	2.48	159,358	145,597

Volume, where especially large, appeared a primary factor affecting several components of total costs, especially costs of a fixed nature.

In addition, increases in average daily volume and in can yield per ton also reduced costs.

The plant with the highest cost per can also had the lowest volume. However, increased volume alone does not insure a reduction in costs. Plant operation, including delivery schedules, must be coordinated or the effect of larger volume may be to increase costs. Note, for example, that Plant I had an increase in costs per case from 1952 to 1953 even though volume increased.

Plant II, as previously mentioned, is a cooperative plant. Its 1953 cost comparisons are not as good as table 30 indicates. This plant operates on a net pool basis. Earnings or losses must be shared by the grower-patrons. Thus the loss suffered in its 1953 operations was reflected in lowered returns to growers for that season's raw product. This cooperative plant, however, was able to make an additional payment to growers from reserves the association had built up in more favorable years. The total cost of \$2.30 should be increased by about 57 cents, the amount of the additional payment. Plant II, on that basis, would not be the lowest cost plant but would rank fifth.

### Cost Data Adjustments

An analysis of costs may lose some of its usefulness in portraying current costs, since it is based upon data collected from a previous period. However, while these costs may change, the relationship among the items and the causes of variations are less likely to change. Changes in costs from the period in which the data were obtained to the current period are caused primarily by the prices paid for the various cost items.

Current estimates of costs and changes in them can be made by adjusting data obtained in a previous period to the current period by measuring the changes in prices for each cost item. As an illustration of this method, the plant having the median total cost per case of \$2.71 was selected (Plant IV). Its costs for 1953 and the adjusted price are given in Table 31. The indices for price adjustments are indicative of price changes. For any given processor, other indices may give more precise results although these selected for this illustration give some general price changes.

The estimates are based upon indices of price changes for each major cost category. It is important to have this breakdown since prices for all items do not change by the same amount. For example, during this period raw product cost declined 12 percent while there was a 16 percent increase in labor costs. The total average cost was estimated to be 3 percent higher in 1956 than in 1953.

In adjusting costs by the index method illustrated it must be emphasized that such adjustments are estimates and therefore do not have the same precision because the original cost data for a given plant may vary from these estimates. This method of estimating costs assumes that the same general processing technique is in use. If there are important changes in the processing techniques the index method alone will not reflect such changes. Thus, the method illustrated should be confined to relatively short time periods. The cost analysis indicates the relationship between costs and such factors as case yields per ton, average daily output, and annual volume processed. A specific plant may want to make further adjustments if there have been important changes in these factors.



Table 31.--Comparison of cost adjustments from 1953 to 1956 for Plant IV

Cost item	1953 cost per 303 case equivalent	Index of cost change from 1953 to 1956	Estimated 1956 cost for 303 case equivalent
	(dollars)	(percent)	(dollars)
Raw product.....	0.645	1 88	0.568
Acquisition.....	.071	1 88	.062
Direct labor.....	.296	2 116	.343
Indirect labor and superintendence.....	.029	2 116	.034
Processing.....	.846	3 107	.905
Shipping and labeling....	.135	4 111	.150
Selling.....	.197	5 102	.201
General plant overhead....	<u>.288</u>	<u>4 111</u>	<u>.320</u>
Total.....	2.507	103	2.583

<sup>1</sup> Index computed from basic data in Agricultural Marketing Service report, Vegetables-Processing, 1956 Annual Summary, December 1956. U. S. Dept. of Agric.

<sup>2</sup> Index computed from hourly wage rates compiled by U. S. Department of Labor for wage rates paid by plants canning fruits, vegetables, and soups.

<sup>3</sup> Index computed from estimates of increases in major processing cost items such as cases, and so on. Basic data furnished by National Cannery Association, Washington, D. C.

<sup>4</sup> Index based upon increases in costs for other items for marketing firms reported in Agricultural Outlook Chart 1957, U. S. Dept. of Agric., November 1956.

<sup>5</sup> Index based upon estimates of selling costs and considers the inflexible nature of such costs as brokerage but, on the other hand, recognizes the increases in salaries of sales personnel and the relatively large proportion of canned corn sold by brokers.



# Appendix

## Definition of Terms

Several terms, not in general usage, frequently mentioned in this study are defined.

1. Case Basis: The most common size can in which corn is packed is the No. 303. The case consists of 24 cans and net weight of a standard case is 24.6 pounds or about 1 pound per can. In this study, all other can sizes were converted to cases of 24 cans of 303 sizes. The conversion factors based on relative volumes were as follows:

<u>Can size</u>	<u>Number in case</u>	<u>Factor used to convert to 24/303</u>
10	6	1.622
1 Picnic	48	1.296
2 Tin	24	1.216
8-oz.	48	1.025

2. Book Value: An accounting term to designate the value remaining in plant equipment, machinery, and other tangible properties after depreciation deductions from original cost have been made. For example, if a plant originally cost \$100,000 some 20 years ago and depreciation from wear and tear and obsolescence for those years has been determined by the plant's depreciation schedule to be \$40,000 and so entered into the audits, this plant would have a book value of \$60,000 assuming no addition to the plant since purchase.
3. Case Yield: As used in this study, it is the number of 24/303 cases of processed corn from a ton of raw product as delivered to the plant.
4. Chart of Accounts: As used in this study, it is a method of keeping a record of expenditures and receipts in a logical grouping that facilitates cost analysis. Cost data obtained from the seven plants were grouped according to the Chart of Accounts (page 42) in order to make the cost comparison as uniform and valid as possible. Operations of the plants varied in some respects and as a consequence their methods of keeping and distributing costs were not completely uniform. This was particularly true where costs were joint between or among products processed in the same plant or multiple plants. The Chart of Accounts is divided into major cost areas with subdivisions of each. Reference to the Chart is necessary to determine specific cost items under each of the eight major cost divisions in the report.
5. Joint Costs: As defined in this study joint costs are those expenses that were not physically divisible between two or more products processed by the same company. For example, five of the plants in the study used some of the same buildings, machinery, and equipment to produce two or more products.

The method of allocation of these overhead joint costs was on the basis of relative volumes of each product produced by a plant. Where there were multiple plants and/or products, the administrative costs were joint and were allocated on a dollar value basis.

6. Style of Product Canned: Plants in this study processed corn into whole kernel, cream, and cremogenized corn. The trade uses the term style to describe these variations in the finished product. Most of the corn in the seven plants was put up in cream, cremogenized, and whole kernel style.

One plant produced a corn product called succotash. Succotash, while composed primarily of corn, also contains lima beans. It may or may not contain sugar or tomatoes, or both.

Whole kernel corn is cut from the cob in whole kernels, and thus its name. Cream style corn is ground or stripped from the cob and combined with starch and sugar. There are also differences between whole kernel and cream corn on the basis of condiments added and the time it takes to cook each style, cooking time for cream style being longer than for whole kernel. Generally speaking, the case yield from a ton of corn processed in cream style is slightly more than that from a ton processed in whole kernel.

Cremogenized corn is cut off the cob in the same manner as whole kernel corn. Kernels used in the cream component are ground up by a comminuter. Additional kernels to be used in the product are run through a slitter. The kernels are then blended into a finished product with the three components--sugar, starch, and corn--in their proper proportions to make what the trade calls cremogenized-style corn.

7. Prepack and Postpack Labor: This is labor performed before the beginning of a processing season and after it is over.
8. Swell Discount: A discount allowed customers of the plants to defray loss from cans that may be improperly processed. Such cans are known to the trade as "swells".

## Chart of Accounts

### I: Processing and Raw Product Cost

#### I-A: Direct Labor

- |   |                                 |
|---|---------------------------------|
| I-A-1 - Receiving                       | I-A-8 - Holidays and sick leave |
| I-A-2 - Preparation                     | I-A-9 - Bonus paid              |
| I-A-3 - Canning                         | I-A-10 - Payroll taxes          |
| I-A-4 - Cooking and cooling             | I-A-11 - Insurance              |
| I-A-5 - Casing and stacking             | I-A-12 - Other (specify)        |
| I-A-6 - Silage (other residues)         |                                 |
| I-A-7 - Handling materials and supplies |                                 |

#### I-B: Superintendence and Indirect Labor

- |                               |                                  |
|-------------------------------|----------------------------------|
| I-B-1 - Plant superintendent  | I-B-8 - Bonus paid               |
| I-B-2 - Engineer or boilerman | I-B-9 - Grading (USDA or others) |
| I-B-3 - Electrician           | I-B-10 - Prepack labor           |
| I-B-4 - Plant mechanic        | I-B-11 - Postpack labor          |
| I-B-5 - Plant watchman        | I-B-12 - Payroll taxes           |
| I-B-6 - Plant janitor         | I-B-13 - Insurance               |
| I-B-7 - Timekeepers           | I-B-14 - Other (specify)         |

### I-C: Direct Raw Product

I-C-1 - Cost of corn (price paid grower x tons received on delivery)

I-C-2 - Net receipts (credit) from silage (other residues)

### I-D: Acquisition

I-D-1 - Trucking expense  
I-D-2 - Fieldman's salary (payroll taxes and insurance)  
I-D-3 - Fieldman's auto expense  
I-D-4 - Field test  
I-D-5 - Field equipment overhead  
I-D-6 - Misc. field expense  
I-D-7 - Net cost of seed ~

I-D-8 - Net cost of fertilizer  
I-D-9 - Net cost of dusting  
I-D-10 - Net cost packer operation  
I-D-11 - Net cost snapper crews  
I-D-12 - Acreage loss  
I-D-13 - Foreign labor  
I-D-14 - Field building overhead  
I-D-15 - Other (specify)

### I-E: Other Direct Processing

I-E-1 - Can cost (by size)  
I-E-2 - Box cost (by size)  
I-E-3 - Sugar  
I-E-4 - Salt  
I-E-5 - Other condiments

I-E-6 - Fuel  
I-E-7 - Power  
I-E-8 - Water  
I-E-9 - Other (specify)

## II: General Administrative and Sales Overhead Expense

### II-A: Administrative Salaries and Other Compensation

II-A-1 - Officers and/or general manager  
II-A-2 - Assistant manager  
II-A-3 - Warehouse custodian  
II-A-4 - Office manager  
II-A-5 - Bookkeeper  
II-A-6 - Secretary

II-A-7 - Sales  
II-A-8 - Office janitor  
II-A-9 - Other office personnel  
II-A-10 - Payroll taxes  
II-A-11 - Payroll insurance  
II-A-12 - Executive life insurance  
II-A-13 - Other (specify)

### II-B: Financing

II-B-1 - Bank service  
II-B-2 - Interest on loan  
II-B-3 - Warehouse fees and expense

II-B-4 - Taxes and insurance (goods in warehouse)  
II-B-5 - Other (specify)

### II-C: Other Administrative and Sales

II-C-1 - Stationery and office printing  
II-C-2 - Office supplies and expense  
II-C-3 - Travel expense  
II-C-4 - Telephone and telegraph  
II-C-5 - Postage  
II-C-6 - Brokerage paid  
II-C-7 - Case discount allowed  
II-C-8 - Cannery allowance  
II-C-9 - Other sales allowance  
II-C-10 - Product claim  
II-C-11 - Continuous USDA plant inspection  
II-C-12 - Sales rejection expense  
II-C-13 - Samples and samples expense

II-C-14 - Advertising expense  
II-C-15 - Direct advertising  
II-C-16 - Electricity, fuel, and water  
II-C-17 - Directors' expense  
II-C-18 - Annual meetings, conventions  
II-C-19 - House organ  
II-C-20 - Assn. dues and subscriptions  
II-C-21 - Donations  
II-C-22 - Entertainment  
II-C-23 - Licenses  
II-C-24 - Legal  
II-C-25 - Audit  
II-C-26 - Collection expense  
II-C-27 - Bad debts

## II-C: Other Administrative and Sales--Cont.

II-C-28 - Warehouse supplies	II-C-34 - Auto overhead - sales and administrative
II-C-29 - Cafeteria expense	II-C-35 - Office building and equipment overhead
II-C-30 - Concession expense	II-C-36 - Other (specify)
II-C-31 - Sundry expenses	
II-C-32 - Corporation taxes	
II-C-33 - Sundry taxes	

## III: Plant Overhead

### III-A: Building and Equipment Overhead

III-A-1 - Processing building	III-A-5 - Preparation equipment
III-A-2 - Warehouse building	III-A-6 - Canning equipment
III-A-3 - Receiving equipment	III-A-7 - Cooking equipment
III-A-4 - Silage equipment (other residues)	III-A-8 - Warehouse equipment

### III-B: Other Plant Overhead

III-B-1 - Fuel, power, water (off-season)	III-B-3 - Plant sanitation
III-B-2 - Waste disposal expense	III-B-4 - Plant supplies
	III-B-5 - Other (list)

## IV: Warehousing Marketing

### IV-A: Labeling and Shipping

IV-A-1 - Labeling labor	IV-A-6 - Shipping labor
IV-A-2 - Labeling payroll taxes and insurance	IV-A-7 - Shipping payroll taxes and insurance
IV-A-3 - Label costs (by sizes)	IV-A-8 - Delivery or drayage
IV-A-4 - Labeling supplies	IV-A-9 - Truck overhead
IV-A-5 - In-plant cartage and freight	IV-A-10 - Other hauling (list)

The items shown in the chart of accounts are for the most part self-explanatory. Descriptions of the accounts shown in the direct labor category are given in detail in the following section which is devoted to direct labor accounts.

## Assembling Cost Information

A series of work forms has been devised to aid processors of sweet corn and other fruit and vegetable products in developing cost information in a uniform and practical manner. These forms supplement rather than replace the usual journal or ledger entries which every canner maintains. Most of the work forms listed below have been pretested in the field and found suitable for their intended purposes; they are listed in their approximate order of use:

### Work Form No.

### Title

1  
2

Prepack and Postpack Labor  
Handling Materials (off-season)

Work Form No.Title

3	Cost of Utilities
4	Inventory Records - Materials
5	Payroll Time Cards
6	Daily Direct Labor - Plant Operations
7	Daily Direct Labor - Handling Materials
8	Daily Direct Labor - Warehouse Operations
9	Record of Raw Product Utilization
10	Materials Used - Condiments and Other Supplies
11	Daily Record of Commodities Warehoused
12	Weekly Labeling and Shipping Labor
13	Land, Buildings and Equipment Overhead

Copies of these work forms are available upon request.

### Costs by Major Processing Operations

Following are summary tables showing plant costs by major processing operations.

Appendix table 1.--Man-hours of direct labor time on 303 case basis by major corn processing operations, 1952

Plant performing operation	Major corn processing operation							Direct labor time per case (303 basis)
	Receiving	Silage	Preparation	Canning (hours)	Cooking and cooling	General warehouse operation <sup>1</sup>	Other direct labor <sup>2</sup>	
	(hours)							
I.....	.0151	.0240	.1512	.0336	.0225	.0457	.0008	.2932
II.....	.0226	.0083	.1636	.0417	.0168	.0443	.0002	.2775
III.....	.0183	.0114	.1593	.0302	.0069	.0373	--	.2634
IV.....	.0129	.0183	.1531	.0367	.0186	.0599	--	.2955
V.....	.0253	(3)	.1719	.0831	.0147	.0189	--	.3139
VI.....	.0386	.0057	.1883	.0555	.0219	.0415	--	.3515
VII.....	.0370	.0092	.1361	.0314	.0145	.0230	--	.2512
Median time.....	.0226	.0092 to 4 .0114	.1593	.0367	.0168	.0415	--	.2955

<sup>1</sup> Includes casing and stacking, crate hooking and handling, box making, stitching, unscrambling, lift truck operations, and other general warehouse direct labor operating time.

<sup>2</sup> Other direct labor includes direct labor on days plant was down during season and direct labor used unloading cans, boxes, and so on.

<sup>3</sup> Silage removed by growers, no expense to plant.

<sup>4</sup> Since only six plants handled their own silage, there is no median plant. Based upon the six plants, the median would fall between .0092 and .0114 hours.

Appendix table 2.--Direct labor costs on 303 case basis by major corn processing operations, 1952 (taxes and insurance excluded)

Plant performing operation	Major corn processing operation							Direct labor total cost per case (303 basis)	Direct labor average wage rate per hour
	Receiving	Silage	Preparation	Canning	Cooking and cooling	General warehouse operation <sup>1</sup>	Other direct labor <sup>2</sup>		
	(cents)								
I.....	1.46	1.90	12.02	2.56	2.13	3.53	.20	23.80	.812
II.....	2.26	.81	15.16	3.99	1.66	4.26	.16	28.14	.946
III.....	1.83	1.10	14.66	2.84	.73	3.57	.75	25.48	.939
IV.....	1.34	1.96	14.20	3.57	1.86	5.44	--	28.37	.960
V.....	2.07	(3)	13.62	6.73	1.31	4.01	--	27.73	.803
VI.....	3.12	.44	14.83	4.57	1.96	3.27	1.45	28.40	.808
VII.....	3.85	.93	13.14	3.31	1.61	2.27	--	25.11	1.000
Median cost.....	2.07	.93 to 1.10 <sup>4</sup>	14.20	3.57	1.66	3.57	--	27.73	.939

<sup>1</sup> Includes casing and stacking, crate hooking and handling, box making, stitching, unscrambling, lift truck operations, and other general warehouse direct labor operating time.

<sup>2</sup> Other direct labor includes direct labor on days plant was down during season and direct labor used unloading cans, boxes, and so on.

<sup>3</sup> Silage removed by growers, no expense to plant.

<sup>4</sup> Since only six plants handled their own silage, there is no median plant. Based upon the six plants, the median would fall between 93 cents and \$1.10.



Appendix table 3.--Man-hours of direct labor time on 303 case basis by major corn processing operation, 1952

Plant performing operation	Major corn processing operation							Direct labor time per case (303 basis)
	Receiving	Silage	Preparation	Canning	Cooking and cooling	General warehouse operation <sup>1</sup>	Other direct labor <sup>2</sup>	
	(hours)							
I.....	.0078	.0319	.1803	.0418	.0194	.0511	.0006	.3349
II.....	.0242	.0136	.1682	.0461	.0170	.0408	.0004	.3103
III.....	.0263	.0116	.1723	.0286	.0075	.0412	--	.2876
IV.....	.0125	.0189	.1405	.0314	.0224	.0375	.0008	.2546
V.....	.0253	( <sup>3</sup> )	.1719	.0189	.0147	.0831	--	.3119
VI.....	.0528	.0093	.2013	.0472	.0226	.0547	.0019	.3892
VII.....	.0354	.0073	.1347	.0214	.0156	.0276	--	.2529
Median time.....	.0253	to 4 .0136	.1719	.0314	.0170	.0511	--	.3119

<sup>1</sup> Includes casing and stacking, crate hooking and handling, box making, stitching, unscrambling, lift truck operations, and other general warehouse direct labor operating time.

<sup>2</sup> Other direct labor includes direct labor on days plant was down during season and direct labor unloading cases, boxes, and so on.

<sup>3</sup> Silage removed by growers, no expense to plant.

<sup>4</sup> Since only six plants handled their own silage, there is no median plant. Based upon the six plants, the median would fall between .0116 and .0136 hours.

Appendix table 4.--Direct labor costs on 303 case basis by major corn processing operations, 1953 (taxes and insurance excluded)

Plant performing operation	Major corn processing operation							Direct labor total cost (303 basis)	Direct labor average wage rate per hour
	Receiving	Silage	Preparation	Canning	Cooking and cooling	General warehouse operation <sup>1</sup>	Other direct labor <sup>2</sup>		
	(cents)								
I.....	.78	2.42	13.64	3.16	1.58	3.91	.46	25.94	.767
II.....	2.35	1.31	15.27	4.37	1.67	3.85	.31	29.13	.930
III.....	2.44	1.12	15.86	2.79	.76	4.07	1.26	28.30	.941
IV.....	1.70	4.16	13.74	3.27	2.87	6.13	.12	31.99	1.126
V.....	2.23	( <sup>3</sup> )	15.59	4.88	1.99	8.18	.21	33.08	.821
VI.....	4.54	.70	15.71	3.98	2.05	4.36	1.52	32.86	.808
VII.....	3.61	.72	12.45	2.06	1.71	3.27	--	23.82	.956
Median cost.....	2.35	to 4 1.31	15.27	3.27	1.71	4.07	to 4 .46	29.13	.930

<sup>1</sup> Includes casing and stacking, crate hooking and handling, box making, stitching, unscrambling, lift truck operations, and other general warehouse direct labor operating time.

<sup>2</sup> Other direct labor includes direct labor on days plant was down during season and direct labor used unloading cases, boxes, and so on.

<sup>3</sup> Silage removed by growers, no expense to plant.

<sup>4</sup> Since only six plants are included, there is no median plant. Based upon the six plants, the median would fall between the two costs given.

Appendix table 3.--Man-hours or direct labor on 303 basis for individual preparation jobs performed, 1952

Plant performing operation	Individual job												
	Husker feeder	Husking	Husker maintenance	Washing	Ear inspection	Trimming	Cutting	Cutter maintenance	Kernel inspection	Silkens	Other <sup>1</sup>	Clean up	Total
	(hours)												
I.....	--	.0307	.0042	--	.0481	--	.0294	.0048	.0031	.0032	.0140	.0137	.1512
II.....	.0019	.0331	.0036	--	.0608	--	.0265	.0040	.0088	.0035	.0088	.0126	.1636
III.....	--	.0308	.0056	.0011	.0431	.0368	.0231	.0064	.0003	.0065	.0025	.0031	.1593
IV.....	--	.0325	.0092	--	.0531	--	.0362	.0055	.0060	.0038	.0032	.0036	.1531
V.....	--	.0533	.0081	--	.0348	.0239	.0186	.0120	.0006	.0084	.0084	.0038	.1719
VI.....	.0041	.0527	.0070	--	.0326	.0164	.0377	.0057	.0165	.0035	.0048	.0073	.1883
VII.....	--	.0348	.0042	.0039	.0436	--	.0270	.0077	.0116	--	.0033	--	.1361
Median time.	--	.0331	.0056	--	.0436	--	.0270	.0057	.0060	.0035	.0048	to	.1593
										<sup>2</sup> .0038		<sup>2</sup> .0073	

<sup>1</sup> Other includes blending, creamogenizing, and brine making.

<sup>2</sup> Since only six plants are included, there is no median plant. Based upon the six plants, the median would fall between the two times given.

Appendix table 6.--Direct labor costs on 303 basis for individual preparation jobs performed, 1952 (taxes and insurance excluded)

Plant performing operation	Individual job												
	Husker feeder	Husking	Husker maintenance	Washing	Ear inspection	Trimming	Cutting	Cutter maintenance	Kernel inspection	Silkens	Other <sup>1</sup>	Clean up	Total
	(cents)												
I.....	--	2.31	.53	--	3.62	--	2.21	.58	.23	.25	1.24	1.05	12.02
II.....	.19	2.96	.39	--	5.44	--	2.39	.47	.78	.34	.97	1.23	15.16
III.....	--	2.79	.62	.12	3.85	3.31	2.06	.69	.03	.64	.23	.32	14.66
IV.....	--	2.94	.97	--	4.82	--	3.29	.60	.54	.36	.32	.36	14.20
V.....	--	4.04	.75	--	2.59	1.82	1.46	1.16	.05	.68	.70	.37	13.62
VI.....	.33	3.98	.70	--	2.44	1.23	3.18	.56	1.23	.27	.43	.56	14.91
VII.....	--	3.22	.50	.41	4.08	--	2.53	.97	1.09	--	.34	--	13.14
Median cost	--	2.96	.62	--	3.85	--	2.39	.60	.54	.34	.43	to	14.20
										<sup>2</sup> .36		<sup>2</sup> .56	

<sup>1</sup> Other includes blending, creamogenizing and brine making.

<sup>2</sup> Since only six plants are included, there is no median plant. Based upon the six plants, the median would fall between the two costs given.



